Report for the year 1966

Commissioner of Public Health

Western Australia

1968

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REPORT of the
Commissioner of Public Health
for the year 1966

Presented to both Houses of Parliament

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The Honourable Graham Charles MacKinnon, M.L.C.,
MINISTER FOR HEALTH

☆

Sir,

I have the honour to submit the Report of the Department of Public Health for the Year 1966.

WILLIAM SHARP DAVIDSON, M.B., Ch.B., D.P.H.
Commissioner of Public Health.

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ANNUAL REPORT, 1966

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The Hon. Minister for Health.

I have the honour to submit the report of the Department of Public Health for the year 1966.

The Report has been delayed because of the late arrival of statistical information around which much of the Report is centred. Because of this delay there are items in the Report which refer to 1967. They have been included to bring the Report up to date as far as possible.

VITAL STATISTICS

The Birth Rate at 20.31 live births per 1,000 Mean Population is a slight incresse on the 1965 figure of 19.85 The Death Rate per 1,000 of Mean Population for 1966 was 8.09, a slight increase on the previous year but the lowest in 1966 for Australia and New Zealand.

Infant Mortality fell to 19.3 per 1,000 live births as compared to the 1965 figure of 21.7, although 19.3 is higher than any figure recorded for the other States in 1966 it should be considered in conjunction with the Stillbirth Rate. Where the two rates are added together, Western Australia, with a figure of 29 per 1,000 total births is surpassed only by South Australia with a figure of 28.9.

Infant Mortality is still much higher in country districts than in the metropolitan areas but the figures of 16.3 for Perth Statistical Division and 24.1 for Rest of State in 1966 show a marked improvement in the country. The corresponding figures in 1965 were respectively 17.1 and 29.

There were 7 maternal deaths in 1966 giving a Maternal Mortality Rate of 0.41 per 1,000 live births, the highest figure since 1961.

LEGISLATION 1966

In the 1966 Session, Parliament passed the following principal or amending Acts.

Tissue Grafting and Processing Act (*No.* 36)

This Act amended the Corneal and Tissue Grafting Act and changed its title. The Act permitted tissues removed from the bodies of donors, to be used for the production of therapeutic substances.

Fluoridation of Public Water Supplies (*No.* 47)

Authorised the fluoridation of any public water supply in the State. An expert Committee was created to advise the Minister.

Health Act Amendment Act (*No.* 35)

Offensive trades which, by the use of modern techniques, were in fact not offensive could be exempted from the usual health restrictions on their operation.

Penalties for general offences, which were fixed at $40 in 1911, were increases to $200.

Medical Act Amendment Act (*No.* 43)

The penal clauses of the Medical Act were amended to give the Medical Board a more flexible range of power to deal with offences in the professional field by medical practitioners.

The Board was also empowered to require a medical practitioner to undergo examination by two psychiatrists if the Director of Mental Health Services reports that the medical practitioner is, in his opinion, " suffering from an illness or intellectual defect which impairs the mental health of the medical practitioner to such an extent that his ability to practise as a medical practitioner is impaired ". The Board may deregister or impose conditions on the practice of such a practitioner.

Optical Dispensers Act No. 44

The craft of optical dispensing was removed from the scope of the Optometrists Act. The administration of the new Act was vested in the Commissioner of Public Health, who was empowered to licence qualified persons to undertake optical dispensing.

Optometrists Act (*No.* 45)

This Act was amended as a consequence of the passing of the Optical Dispensers Act.

Perth Medical Centre Act (*No.* 54)

This Act was passed to enable a Medical Centre to be established at Hollywood, and constituted a Trust for the development, management and control of certain lands for the purpose.

Poisons Act Amendment Act (No. 23)

The principal amendment prohibited the cultivation, possession, sale or purchase of prohibited plants. This related to plants from which " a drug of addition may be obtained, derived or manufactured ". Permits may be issued to organisations and *bona fide* persons engaged in research or scientific pursuits.

REGULATIONS

Food and Drug Regulations

A large number of amendments, recommended by the Advisory Committee, were published in the *Government Gazette* on 10th February, 1966.

Poisons Regulations

Amphetamine and Barbituric Acid were declared to be specified substances. This makes their supply and use subject to control similar to drugs of addiction. (*Gazette* Twenty eighth January 1966).

Chiropractors Act

Rules of the Board published ninth May, 1966.

Pesticides Regulations

New regulations regulating the use of fumigants and the licensing of fumigators. (*Gazette*, Thirty first May, 1966).

Bedding and Worn Clothing

New regulations requiring specified cleansing and labelling. (*Gazette*, Twenty seventh October, 1966).

PUBLIC HEALTH LABORATORIES

Dr. Laurie's report again highlights the difficulties faced by his department in maitaining an efficient service in the face of increasing demands, inadequate accomodation and staff shortages at all technical levels.

For many years the Public Health Laboratories have endeavoured to carry on their functions in borrowed or in temporary accomodation.

With the rapid progress in the development of medicine as an exact science and its ever less claim to be an art, the demand on the laboratories to provide methods of diagnosis and control of treatment is an ever insistent and increasing one. This demand emanates not only from specialist medical practioners for the care of hospital patients, but is coming more and more to be required for the care of the patient in the hands of the general practitioner.

It is not, therefore, at all surprising to find that the work of some laboratory sections has increased in the vicinity of 50 per cent. in the past year. To try to keep up with the situation the central laboratory now exists in no less than five different locations throughout the metropolitan area and much of the work is carried out in temporary pre-fabricated accommodation.

Dr. E. M. Mackay-Scollay arrived during the year to direct the microbiology and virology divisions and Dr. V. Blackman arrived to take over pathology and biochemistry. These two officers were replacements for vacancies that had occurred. Dr. D. Hainsworth was added to the staff to complete with the tremendous increase taking place in the forensic pathology section.

The work-sheets show that an alarming amount of overtime is worked both in the central and country laboratories and these work-sheets give no indication of the long hours of work put in by senior officers on the medical staff.

In order to contain a situation where demands are rapidly increasing on a staff to which recruitment is becoming increasingly difficult it is necessary to make use of all modern facilities in the way of automation of laboratory investigations and the collection and sorting of data relevant to laboratory reporting and accountancy. The laboratory is developing these techniques and acquiring the equipment and this aspect of progress should receive considerable prominence in future reports.

To meet staff shortages at the technology level a course was commenced at the Institute of Technology to provide a three year full-time course for the training of medical laboratory technologists. This replaces the present five year in-service course. The Department provided cadetships for a number of cadets for this new course.

Country laboratories showed an increase in work of 20.6 per cent. in unit values but this increase would have been vastly greater had we been able to provide the staff and facilities to meet all the requests of country doctors.

To obtain a true appreciation of the work of the laboratories, Dr. Laurie's detailed report should be studied. Added to the report is an appendix showing the isolations made by the Salmonella Diagnostic and Reference Laboratory which has only been obliquely referred to by Dr. Laurie as that appendix was not available at the time he wrote his report.

TUBERCULOSIS CONTROL

Dr. Edwards has provided extensive statistics of the position regarding 1966. The number of notifications and the number of persons on the register continuing to diminish. There were, however, 16 deaths in 1966 compared to the abnormally low figure of 12 in 1965.

Men continued to show a peak of incidence of the disease in their fifties and sixties but the high incidence of tuberculosis in young women is now a thing of the past.

Present tendencies suggest that tuberculosis will soon become a disease of epidemiological significance in men only. Because of the decrease in incidence in the lower age groups, compulsory chest x-ray is now confined to the 25 year olds and over.

EPIDEMIOLOGY AND SPECIAL SERVICES

The reported incidence of notifiiable disease continues to decline. Typhoid fever, poliomyelitis and diphtheria are such rarities that they can almost be regarded as things of the past. This would of course only remain true if our standards of sanitation and vaccination are maintained.

There have been no fresh cases of poliomyelitis notified for over three years.

The work of our trachoma control teams is slowly showing effect in the areas where they operate. Since 1962 the incidence in the population examined (largely an aboriginal population) has fallen steadily from 56.8 per cent. in 1962 to 36.2 per cent. in 1966.

The tables show that the main reservoir of infection is in infants and pre-school children and this group has been least affected in the general decline. It follows that in trachoma eradication we must concentrate on the pre-school child.

Venereal Disease

Because of the delay in presenting this Report, 1967 figures have been included in the Tables.

There are one or two noteworthy features in the 1967 figures. The number of notifications has increased from 710 in 1966 to 839 in 1967. This, however, is a considerable slowing in the rate of increase compared to the previous year which showed an increase to 710 from 462.

The plea put forward in last year's Report regarding the need to find and treat the unsuspecting female carrier of the disease seems to have borne fruit as shown in the disproportionate increase in female notifications.

Male notifications increased 13 per cent. (615 to 696), female notifications 50 per cent. (95 to 143). Of the 143 female notifications no less than 62 or 43 per cent. were under the age of 20 years.

All in all the 1967 figures are a substantial vindication of the hypothesis put forward last year that the control and examination of the promiscuous juvenile female are major factors in the control of the disease and it is towards the detection of non-apparent disease in this group that we should concentrate our attention and it is on the juvenile female that society should concentrate its efforts to reduce the trend towards promiscuous relationships.

Although the more serious disease of syphilis has now, for some years, played a minor role in our venereal disease problem there are recent indications that it is on the increase. The number of cases doubled in 1967 and now represent five per cent. of the total V.D. notifications compared to 2.8 per cent. in 1966.

CHILD HEALTH

The number of infants and pre-school children attending centres continues to increase. The increased work has been coped with without increase in staff.

Our infant morbidity and mortality figures are distorted because of the incidence of infection in native children and the numbers of these children in the population.

The introduction of Health Sisters to remote areas in the Kimberleys based on A.I.M. hospitals is already showing beneficial effect on the incidence of disease in native infants, but education of the aboriginal mother is a long business.

A dietary survey of kindergarten children displayed no marked dietary deficiency. Only 37 per cent. were being given flouride tablets by their parents.

Dr. Edmonds has provided an extensive report on the work of his branch which contains several items of interest and should be studied in full.

OCCUPATIONAL HEALTH

Dr. Letham's report gives some indication of the increasing activity of his department and diversity of of function in the prevention or reduction of danger to health from the ever-increasing multitude of hazards associated with modern industry.

The application of the requirements of the Clean Air Act has added much to the activity of his department.

The report should be read in full to gain some appreciation of this.

Two major items are of particular interest—pneumoconiosis from asbestos mining and deafness in the Goldfields mining industry.

Although repeated warnings have been given by the Public Health Department over the years regarding the danger of asbestos dust, the industry has been slow to appreciate the situation. The figures in Dr. Letham's report are their own commentary on the situation.

Up to the time the Blue Asbestos mine closed in December, 1966, 90 men were known to have developed pneumoconiosis and 12 of these have died. Of the 90 men only 30 had previously been employed with exposure to pneumoconiotic dusts.

A pneumoconiosis takes some years to develop we can be certain that many more cases will subsequently be diagnosed.

The facility with which asbestos dust produces asbestosis and its marked association with malignant disease of the lung make it essential that all work connected with this material is done to the most rigid standards of dust control and that waste material from the mines containing asbestos fibre is disposed of in a manner which prevents the fibres becoming air borne and so menacing the health of local inhabitants.

The number of Goldfields' miners with severe hearing loss is surprisingly high. The percentage figures in the report are not a true picture of the incidence of deafness in miners as all those examined were volunteers and naturally those with a degree of deafness were the most likely to volunteer.

Deafness, however, in this type of mining is obviously a very prevalent defect and as it is caused by noise in the industry it is a problem to which the mining engineer should give his serious attention.

ENDEMIC DISEASE IN NATIVES (KIMBERLEY AREA)

Dr. Elphinstone has given a summary of the position regarding the major diseases.

Despite the availability of modern and more effective drugs it is clear that eradication of endemic disease in the native is largely a matter of education in sanitary living and improvement in living conditions. To this end Dr. Elphinstone's remarks about the provision of individual toilet facilities for each family or household on some missions is of considerable interest.

Communal facilities spread disease, but individual facilities provide a means for supervision of behaviour of persons using the facilities and so leads to education in sanitary living.

It is a matter of some importance that in providing accommodation for natives we make every endeavour to provide household toilet facilities for which each family is responsible and avoid communal facilities for which no-one takes responsibility, and which become areas for the deposition and exchange of various organisms of infection.

Other points to Dr. Elphinstone's report are—the use of Ethionamide in leprosy ; salt as a means of destroying hookworm larvae in the soil ; the evidence of treponemal infection in desert natives and an area in the Eastern Kimberleys which is associated with a high incidence of torulosis in natives.

PUBLIC HEALTH NURSE IN THE KIMBERLEYS

The prevalence of infectious disease and a high infant morbidity and mortality among aboriginals has for long been a problem with which we are deeply concerned.

Much of the endemic disease arises from an insanitary form of living and the difficulty has not only been the provision of sanitary facilities but also the need to educate the native in the use of such facilities.

In 1966 it was decided to try the effect of a concentration of effort on mothers and their babies and young children in the hope that from them an appreciation of hygiene and sanitary living would spread throughout the aboriginal community and so produce in it a demand for a better standard of living which it could live up to.

The Department entered into an agreement with the Australian Inland Mission whereby the Mission supplied a suitably trained nurse and provided her with accommodation and a vehicle and the Department provided her salary. Sister Pat MacPherson was selected for this appointment and she was stationed at the A.I.M. hospital at Fitzroy Crossing to work in the surrounding area. Her duties, her difficulties and the success of her activities are described in her report which must be read in detail to get some appreciation of the magnificent work of this nursing sister and some idea of her ingenuity and determination in overcoming the obstacles, indifference and ignorance that surrounded her.

After nearly two years of hard work and near despair she has finally come to believe that she is at last making headway towards worthwhile and enduring results.

However critical Sister MacPherson might be of her own success, I myself, have no doubts as to the success of the experiment ; so much so that two further appointments, similar to Sister MacPherson's have already been made—one at Halls Creek and one at Kununurra—and further appointments are on the way.

SUICIDE

Morbidity statistics from metropolitan hospitals have been collected since 1958. These were examined with regard to attempted but unsuccessful suicides. 1,900 cases were tested.

During the same periods there were 510 fatal suicides in the metropolitan area and 326 in the rest of the State.

Suicides in Western Australia therefore accounts for over a hundred deaths per year, or a little less than half motor vehicle accident deaths. Suicide is tenth on the list of Principal Causes of death and therefore is a disease of some importance.

An analysis of the figures shows that successful suicide is mainly a disease of elderly men and unsuccessful suicide a disease of young women. The means of suicide is largely the means most readily available, but women show a marked preference for the less lethal forms.

Agricultural workers and miners show a low tendency to commit suicide with the exception of shearers, where there is an apparently high incidence. A high incidence is also apparent in students, clerks, shopkeepers and salesmen.

The disease is of such social and epidemiological importance that it requires more detailed psychiatric and statistical recording and evaluation.

HOSPITAL MORBIDITY STATISTICS

These statistics for the major metropolitan hospitals are presented in the form as for previous years. They show a remarkable similarity with previous years.

1,254 extra patients were admitted during the year compared with 1965 with an increase daily average of 78.5 beds occupied. This expansion of bed accommodation was largely accomplished at the Sir Charles Gairdner Hospital.

Accidents occupied 16.94 per cent. of the beds in 1966 compared to 16.74 per cent. in 1965, with motor vehicle traffic accidents occupying 5.42 per cent. of the beds in 1966, as compared to 6.19 per cent. in 1965.

Morbidity statistics for 1966 from Derby District Hospital have been included in this Annual Report.

These statistics are of particular interest because this hospital serves a white population and an aboriginal population approximately equal in numbers and differences in the hospital statistics of the two communities must reflect differences in their socio-economic position or in their natural predisposition to disease.

The Derby statistics are presented in the same form as for metropolitan hosptials but instead of being divided into male and female patients are shown as white and aboriginal.

The main features of interest are that although the communities are roughly equal in composition and number the aboriginal community has 50 per cent. more admissions to hospital and the cases admitted to hospital spend 50 per cent. more time in hospital than white patients. In other words twice as many hospital beds are required for an aboriginal population than for a white population.

Except in the very old the increased length of stay of aboriginals in hospitals is common to all age groups but the increased number of admissions is in the very young and the very old.

Infectious disease, disease of the intestines, and above all diseases of the respiratory system are the main reasons for increased admission of natives. Surprisingly enough there were fewer admissions for accident and trauma in the natives compared to the whites, and aboriginal women had a much higher rate of complications in delivery and puerperium than white women.

The tables give many indications of minor differences which will only be substantiated or reputed when larger numbers are investigated.

The statistics indicate that the high demand for beds in an aboriginal population is due to a low standard of sanitary living causing increased infection, a low resistance to virus infection with respiratory complications and an absence of suitable home conditions for the early discharge of convalescents.

W. S. DAVIDSON
Commissioner of Public Health

Appendix I

Public Health Laboratory Service

Annual Report, 1966

To the Commissioner of Public Health, Western Australia :

I. ADMINISTRATION

General

Our responsibilities have not changed, *i.e.*, this is a combined hospital and public health laboratory service, responsible for providing a hospital laboratory service for a total of over 4,000 beds, together with State public health laboratory facilities, and also police laboratory investigations.

Accommodation

The accommodation problem is increasingly acute, with more and more temporary quarters being taken into use. Unfortunately, the plans for building a large central laboratory appear to have been held in abeyance, at least for the foreseeable future.

Tours and Conferences

Shortage of staff has been so serious and acute that the only worker to attend a conference was one of the non-medical staff.

Working Hours

Hours of work remained the same as before ; the laboratory is officially open 14 hours daily for seven days weekly : in addition, staff are on call for emergency work outside these hours. The emergency work represents a severe demand on laboratory staff : for example, in December 1966 the Central Laboratories worked 1,100 hours overtime at a cost of over $2,000. Eighty per cent. of this work was for one hospital.

Character of Work

There has been no change in the pattern of work excepting that forensic work has shown a marked increase.

Increasing Demands

All sections of the Central Laboratories and all the Country Laboratories show a significant increase in work done, with the increase being especially marked in certain Central Laboratory sections, *e.g.*, Bacteriology, and in the newer Country Laboratories.

One problem which remains serious is the requesting of laboratory investigations on patients in dribs and drabs, one to two tests daily as the need seems to arise. The end result is that the patient may be bled daily for 3–4 days and sometimes twice in one day, and then receives a heavy bill for the investigations. Since a significant proportion of such tests are found to give results within a normal range, (85 per cent. of all white cells counts and differential counts are normal) a great load could be taken off the laboratories if the older methods were followed, namely, for junior resident medical officers to screen their patients in ward laboratories prior to asking for investigations.

This seems to be impossible and we therefore propose so to automate the laboratories that, with the permission of clinicians, we shall routinely "screen" each individual on admission by the carrying-out of a battery of tests on one blood sample, with much reduction in costs and in inconvenience to the patient.

Laboratory Costs

Although the economic spiral continues upwards the cost per unit of laboratory work has fallen still further largely due to improved techniques and a work increase which further lowers the relative proportion of the administrative and other non-productive costs.

II. STAFF

1. *Changes* (including Branch Laboratories)

Position	Recruited		Resigned
Microbiologist	1	To replace Officers who resigned in 1965	....
Pathologist-in-Charge	1		....
Pathologist	1		....
Technologists	10		6
Laboratory Assistants	3		3
Laboratory Attendants	43		40
Clerks	3		3
Typists	1		....
Cadet Technologists	8		....

The above table shows staff changes for 1966. Dr. E. M. Mackay-Scollay arrived in February 1966, to take over the Microbiology Division, a post which had been vacant for five months following the death of Dr, Nicholas Kovacs. Dr. D. Hainsworth arrived in August 1966 from the Forensic Department, Leeds University, to take up the position of Forensic Pathologist to assist the Director in the much increased work of the Forensic Section. Dr. V. Blackman arrived from England in September, 1966 to assume over-all responsibility for the Departments of Pathology (including Cytology and Forensic Pathology), Biochemistry, and Haematology : Dr. Blackman had served in these various capacities in other parts of the world.

These recruitments do not represent an increase : they are merely a filling of vacancies caused by resignations and death. Important as these recruitments are they therefore do not represent any increase in senior medical laboratory staff, which means that the number of pathologists on the staff is low compared with what it should be and compared with other similar institutions in Western Australia. In this connection it is pertinent to quote an excerpt from a WHO report on the problem—

> *The need for adequate health laboratory services*
>
> " Health authorities must . . . appreciate the fact that lack of adequate laboratory services has serious repercussions on the health of the entire nation and hence on the total economy. The present age is witnessing a rapid crumbling of time and space barriers producing much faster spread of disease, with the result that the health—or ill health—of one country is no longer the concern of that country alone, but concerns all other countries no matter how far away they may be. The health laboratory is essential to the global fight against disease, which in turn demands reliable and comparable laboratory results. Such results cannot be obtained if the staff are not qualified and placed in positions suitable to maintain their standard."
>
> From : *The training of Health Laboratory Personnel* (*Technical Staff*) : *Fourth Report of the WHO Expert Committee on Health Laboratory Services* (*Wld Hlth Org. techn. Rep. Ser.*, 1966, 345), p. 4.

2. *Sickness*

The staff sickness rate rose to 1.88 per cent. of 43,105 man days worked in 1966 : this is a rise of 40 per cent. over the figure of 1.34 per cent. lost in 1965. From the breakdown table below it will be seen that the loss was once more disproportionately high among laboratory attendants who, although 50 per cent. of the work force, were responsible for almost 70 per cent. of the time lost ; again, within this group a few individuals made up a substantial total of the time lost, with three attendants being responsible for 83 working days lost.

Sickness Analysis—

Medical staff	who make up	4%	of the work force,	accounted for	0.1%	of the working days lost
Senior Technologists	,,	13%	,,	,,	3.5%	,,
Technologists	,,	10%	,,	,,	9.2%	,,
Clerical Staff	,,	8%	,,	,,	7.3%	,,
Laboratory Assistants	,,	11%	,,	,,	10.3%	,,
Laboratory Attendants	,,	50%	,,	,,	69.1%	,,
Cadet Technologists	,,	4%	,,	,,	0.5%	,,

3. *Training*

The shortage of competent, qualified medical laboratory workers is well-known and widespread, and caused by various factors.

The Public Health Department, Public Service administration, and the Technical Education Division of the Education Department, co-operated in the launching of a three year, full-time course of training for medical technologists and the first intake of cadets commenced training in 1966.

Senior staff of the Public Health Laboratory Service contributed with lectures, demonstrations, supervision and direct instruction of the cadets on medical laboratory techniques.

In this inaugural year cadets were trained in these laboratories in those required subjects which were not then available at the Institute of Technology at Collier. Two cadets of the Department of Agriculture, two private students and eight cadets of the Public Health Department were involved.

III WORK DONE, 1966

1. *General*

In a series of tables in the Appendix detailed information is given of the work done in the various sections of the Central Laboratories and in the Branch Laboratories.

Table 1 (a) summarises the work in the different sections of the Central Laboratories. Once more, all departments showed an increase in work done (in the Pathology report an explanation is given for the apparent anomaly in the work of the Cytology section). The over-all Central Laboratories increase is 17 per cent. compared with work done in 1965. The largest sectional increase was in Biochemistry, which showed an increase of 48 per cent. in 1966 work compared with that of 1965.

The Branch Laboratories work is summarised in Table 1 (b) of the Appendix, from which it will be seen that the work in 1966 was over 20 per cent. greater than in 1965. This is discussed in more detail under Section IV : Branch Laboratories.

Reference has been made in previous Annual Reports to the contribution made by officers in Branch Laboratories. Some of these posts are very remote, and all demand considerable initiative and personal qualities from staff.

All branches were visited by senior officers during 1966, but mostly only once and briefly. More frequent inspections of longer duration are most desirable from several points of view, and only prevented by the overall shortages of staff. Branch personnel who are brought to Perth for brief refresher courses to keep abreast of technical advances or other reasons, usually seem to return to their laboratories more content, with a clearer view of the overall picture, and a sense of " belonging ". Isolation appears to engender (quite erroneously) a feeling that they are forgotten men. Regular annual or biennial refresher periods for all country technologists are planned and will be implemented when the staff position permits.

2. *Microbiology*

Arising out of staff changes attendent on the death of Dr. N. Kovacs in September, 1965, and the appointment of Dr. E. M. Mackay-Scollay as Head of the Division in March 1966, there was a widening of the field of microbiological coverage, and a shift of emphasis in certain sections of the work.

These changes necessitated an extension of the laboratory accommodation, which was already stretched to the limit of efficiency in the Sir Charles Gairdner Hospital, and a Microbiology II Annexe had to be opened in which a new section was established for clinical laboratory work received from general medical practitioners in the metropolitan area and in country districts beyond the reach of the peripheral laboratories of the Service.

The Food Hygiene Section, and the Salmonella—Shigella Investigation and Reference Unit, were transferred to the new annexe while new sections for Mycoplasma and Immunoflourescence work were set up.

In extending the laboratory accommodation still further, it was recognised that the dispersal of the Division to yet another site in the metropolitan area—making a total of five—was an interim expedient pending the planned unification and rehousing of the Public Health Laboratories as a whole.

The work of the Microbiology Division is summarised in the tables shown in the Appendix—Tables 2 (a)—2 (f). In the interest of continuity, the tables accompanying the text have followed, with certain exceptions, previous practice.

The tabulation of Salmonella serotypes has been considerably condensed by the omission of a list of specific serotypes examined during the year. These serotypes have become so numerous as to be unwieldy in a report of this nature and they will form part of the subject matter of a separate report on the work of the Salmonella Investigation and Reference Unit of Western Australia.

Another departure from precedent is the addition of a chart (Figure 1) illustrating the trend of work performed by the various sections over the five year period 1962–1966. (This chart is included at the end of this report).

Clinical Bacteriology

Table 2 (a) (Appendix) shows the work done in this section which is now divided between the laboratories in the Sir Charles Gairdner Hospital and a town annexe.

Noteworthy in this section is the continuation of the rise, reported in 1965, in the number of tests carried out for venereal diseases. Table " A " hereunder shows that 2,246 examinations were made in 1966 compared with 1,918 in 1965—a rise of 8.7 per cent. The ratio positive culture/positive smear remained virtually the same at 1:2.2 and this was probably related to the continued use of Difco GC medium with supplement A.

Table " A "

COMPARISON OF RESULTS OF CULTURE AND SMEAR EXAMINATION FOR

N. gonorrhoea—1966

		Males	Females	Total
Smear +	Culture + ...	128	6	134
Smear +	Culture —	80	5	85
Smear +	No Swab	47	2	49
Smear —	Culture + ...	12	4	16
No Smear	Culture + ...	15	38	53
Total Positives		282	55	337
Smear —	Culture —	351	713	1,064
Smear —	No Swab	57	31	88
No Smear	Culture —	61	696	757
Total Specimens		751	1,495	2,246

Bacteriuria

A considerable amount of work was carried out on definitive methods of enumerating bacteria in urine as a means of determining significance in bacteriuria. A paper incorporating the successful results of this work is in preparation.

Stem Laboratory

During the year a stem laboratory was opened in the hospital for the convenience of clinical staff. Blood culture, urine analysis with culture and sputum culture with sensitivity testing, were procedures exclusively catered for in this scheme. The success of the venture has, however, been variable and irregular.

Water and Sewage—Bacteriology

The work of this section is summarised in Table 2 (b) (Appendix).

Enteropathogen Laboratory

The work done in this laboratory is recorded in Table 2 (c) (Appendix). This work has centered mainly on the Salmonella-Shigella Investigation and Reference Unit. Table " B " hereunder shows that the serotyping of Salmonella strains has more than doubled : 686 strains were examined in 1966 compared with 321 in 1965. The infection of man and animals by more than one type of Salmonella has been repeatedly shown to occur, particularly in the North of Western Australia. The comparative absence of *Salmonella typhimurium* infections in man in this geographical region is an interesting finding. Table " C " hereunder shows the Shigella strains isolated during the year and the antibiotic sensitivities determined for the various species.

Table " B "

COMPARISON OF 686 SALMONELLA STRAINS COMPRISING 51 SEROTYPES EXAMINED IN 1966

Human	Animal Species			Sewage	Strains Received For Typing
	Kangaroo Meat	Indian Prawns	Lizards		
265 .... (190 cases)	13	12	21	11	364

Table " C "

SHIGELLA ISOLATIONS AND SENSITIVITY RESULTS 1966

Shigella Strains	Total cases	Total Isolations	Total Tested For Sensitivity	Oxytetracycline	Chloramphenicol	Neomycin	Furoxone	Sulphadiazine	Colimycin	Ampicillin	Kanamycin*
Shigella flexneri type 1	55	64	51	40	40	50	51	23	51	48	35 (41
Shigella flexneri type 2	25	27	25	24	22	24	25	0	25	23	20 (21)
Shigella flexneri type 3	3	3	2	1	1	2	2	0	2	1	2 (2)
Shigella flexneri type 4	1	1	1	1	1	1	1	0	1	1	1 (1)
Shigella flexneri type 5	4	4	4	2	3	4	4	0	4	4	3 (3)
Shigella flexneri type X	1	3	3	0	0	3	3	0	3	3	3 (3)
Shigella sonnei	49	56	48	32	31	44	46	14	46	31	26 (27)
Shigella schmitzii	21	22	22	16	20	22	22	2	22	21	17 (18)
Totals	159	178	156	116	118	150	154	39	154	132	107 (116)

* Kanamycin, first used February 1966. Figures in brackets represent total tested.

Enrichment Medium

Work on a comparison of Rappaport and selenite enrichment broths in recovery rates for Salmonella species was completed, and the paper reporting on the results is in the press. An extension of this work with a new medium has been started, and preliminary experiments suggest a favourable outcome.

Biochemical Testing Media

Salmonella identification media " GHSSA " and " UMA " have been issued to country laboratories in the form of a pair of culture tubes, and, as a result, the preliminary diagnosis of Salmonella and Shigella infections has been speeded up and made more certain.

Parasitology

Table " D " hereunder shows the number and types of parasites identified.

Table " D "
PARASITOLOGY RESULTS
Identified Central Laboratories

Parasite	Total Identified
Hymenolepis nana	22
Giardia lamblia	16
Ancylostoma duodenale	11
Trichuris trichiura	10
Strongyloides stercoralis	7
Ascaris lumbricoides	5
Enterobius vermicularis	3
Toxocari cati	1

Mycobacteria Laboratory

The work of this section, with the exception of that of the World Health Organisation Reference Laboratory, fell considerably during the year as is shown by the figures in Table 2 (d) (Appendix). This reduction was mainly due to a curtailment of certain projects launched by Dr. Kovacs during the previous year.

For a number of years Dr. Kovacs had been carrying out extensive investigations in the search for an autoclavable medium for the isolation of *M. tuberculosis* and atypical mycobacteria alike. Numerous combinations of ingredients had been incorporated in a solid medium but although progress had been undoubtedly made the ideal medium eluded him.

Nevertheless, if his work was not to be entirely wasted, a comparative trial of his media had to be undertaken. Over 1,000 consecutive routine specimens were inoculated in parallel on six media with Lowenstein Jensen media serving as controls throughout. Briefly, the results showed a marginal superiority of one trial media for the isolation of all mycobacterial species ; the control media proved slightly superior to all trial media in the isolation of *M. tuberculosis* and *M. Battey*. The results of this trial will form the substance of a separate publication.

A considerable amount of work was concentrated during the year on adapting all drug sensitivity testing to solid media and in stream-lining techniques.

990 strains of *M. tuberculosis* var. hominis were tested for sensitivity to streptomycin, isoniazid, para-amino salicylic acid and ethionamide. Table E hereunder shows the sensitivity pattern of strains from 21 patients found to have resistance to 1 or more of these 4 drugs. A full report on the sensitivity of *M. tuberculosis* and atypical mycobacteria to a variety of drugs is being prepared for publication. The isolation, identification and sensitivity testing of atypical mycobacterial strains continue to absorb a considerable amount of work effort in the section. The distribution of groups (Runyon Classification) is shown, together with those of previous years for comparison, in Table " F ".

Table " E "
M. TUBERCULOSIS STRAINS FROM 21 PATIENTS WITH RESISTANCE (RR 4)
TO ONE OR MORE ANTI-TUBERCULOSIS DRUGS

1 Drug Only		2 Drugs Only		3 or 4 Drugs	
Streptomycin (SM)	3	SM and INH	4	SM and INH and PAS	5
Isoniazid (INH)	5	SM and PAS	0	SM and INH and PAS and ETH	1
Para Amino Salicylic acid (PAS)	2	INH and PAS	1		
Ethionamide (ETH)	0				
Totals	10		5		6

Mycoplasmas

Interest in these micro-organisms has become widespread and intense. *Mycoplasma pneumoniae* (Eaton agent) has been proved as the responsible agent for a type of atypical pneumonia. *Mycoplasma hominis* has been associated with an etiological role in Reiter's syndrome, although the evidence in favour is inconclusive. Other mycoplasmas have been found in leukaemic tissues and in rheumatoid arthritis. Whether or not mycoplasmas, other than Eaton agent, are truly responsible for initiating disease processes, these micro-organisms make a considerable challenge to microbiological epidemiology.

Isolations of Mycoplasma species were made from clinical material but an evaluation of their significance had to wait on type identification and this in turn could not be carried out until the receipt of essential materials and equipment from overseas.

Table " F "

ISOLATIONS OF UNCLASSIFIED MYCOBACTERIA

Specimen	1963				1964				1965				1966				Total
	Group				Group				Group				Group				
	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	
Sputum	8	28	347	12	9	68	426	13	18	40	547	7	17	87	401	9	2,037
Bronchial Lavage	....	....	....	....	....	4	3	....	....	....	....	....	....	....	....	....	7
Laryngeal Swabs	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0
Gastric Contents	....	....	2	1	....	2	2	....	....	1	9	....	....	....	....	....	17
Pus	....	....	....	....	....	....	3	....	....	....	....	....	....	....	....	....	3
Urine	....	....	....	2	....	....	5	2	....	....	....	....	....	....	....	....	9
Resected Lung Tissue	....	....	....	2	....	....	1	....	....	....	2	....	....	....	....	....	5
Lung Tissue }	....	....	....	2	....	....	3	....	....	5	4	....	1	....	3	....	18
Lymph Node } Taken at P.M.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Bone Marrow }	....	....	....	1	....	....	....	....	....	....	....	....	....	....	1	....	2
Faeces	....	....	....	4	....	....	2	....	....	....	1	....	....	....	....	....	7
Pleural Fluid	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	1
Gland	....	....	....	3	....	....	2	....	....	....	1	....	....	1	7	....	14
Seminal Fluid....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
SO2 Aerosol	....	....	....	....	....	....	....	....	....	....	....	5	....	....	....	....	5
Total	8	28	349	27	9	74	447	15	18	46	565	12	18	88	412	9	2,125
Grand Total				412				545				641				527	2,125

Virology Laboratory

The work done in the virus laboratory during 1966 is shown in Table 2 (f) (Appendix). The volume of work carried out during 1966 was almost double that of the previous year. In large part this was due to the survey carried out in the North-West by the enteropathogenic laboratory in which a search for micro-organisms of Salmonella and Shigella groups as well as viruses, was made. Shortly after the pediatrician left the North-West area on completion of this survey an ill-defined epidemic of diarrhoea and vomiting broke out in which some children died, but from which no virus or bacterial agent was isolated. However, when the epidemic subsided the familiar cytopathic agents were again in evidence.

In the accompanying Table " G " hereunder the various viruses isolated in the virological laboratory during the year are shown. Many of the ECHO viruses were still being typed at the end of the year—a time consuming procedure which had to be delayed because of the shortage of skilled staff in the laboratory.

Of particular interest during the winter months was clinical evidence of influenza-like illnesses. However, only a few myxovirus isolations were made. This was largely due to the paucity of specimens and to the general unsuitability of those that were sent into the laboratory. Three strains of influenza A virus, which was isolated during this period, were sent to the WHO Influenza Reference Laboratory in the Commonwealth Serum Laboratories, Melbourne for typing.

Table " G "

VIRUS TYPES ISOLATED IN 1966

Enteroviruses	Coxsackie A 9	15
	Coxsackie A (UT)	13
	Coxsackie B 3	2
	Coxsackie B 4	2
	Coxsackie B 5	14
	ECHO 9	3
	ECHO (UT)	122
	REO	2
Respiratory viruses	Myxovirus Influenzae A	3
	Myxovirus para-influenzae 1	1
	Myxovirus para-influenzae B	4
	Respiratory syncytial	2
	Adenovirus (UT)	13
Herpesvirus		12
	Total	215

Sudden Unexplained Death in Infants

An investigation, in conjunction with the forensic section, was started to study the etiology of so called " cot deaths " particularly with reference to viruses. One of the difficulties in this type of work is that the body is available for post-mortem examination only relatively late after death, and too late in most cases for the isolation of labile viruses such as Respiratory Syncytial virus and Herpesvirus. The investigation has to be regarded as one of long term since the number of cases coming to notice is numerically small.

Again it is noticed that the tissue culture cells received from Commonwealth Serum Laboratory were repeatedly contaminated with simian viruses. This fact reduced the chances of making human virus isolations, and the wastage in time and materials due to this cause was considerable. It is understood that the Commonwealth Serum Laboratories have the position under review and have taken some specific action to remedy this defect.

Mycology

The work of the mycology laboratory is presented in Table 2 (e) (Appendix). In January a long term survey was begun, in co-operation with metropolitan dermatologists, to determine the different species of dermatophytic fungi responsible for infections of the skin. It was arranged that patients attend the laboratory in order that the most suitable specimens be taken for investigation. The importance of excluding fungi as a cause of particular skin lesions was recognised.

During the year " Black Dot Ringworm " a form of Tinea capitis, normally rare in Western Australia, was identified on 9 occasions. *Microsporum canis* was isolated from 240 specimens.

In common with laboratories in other parts of Australia and overseas the laboratory has had to introduce a variety of additional tests for the differentiation of *Trichophyton rubrum* and *Trichophyton mentagrophytes* because of the unreliability of the " hair penetration method."

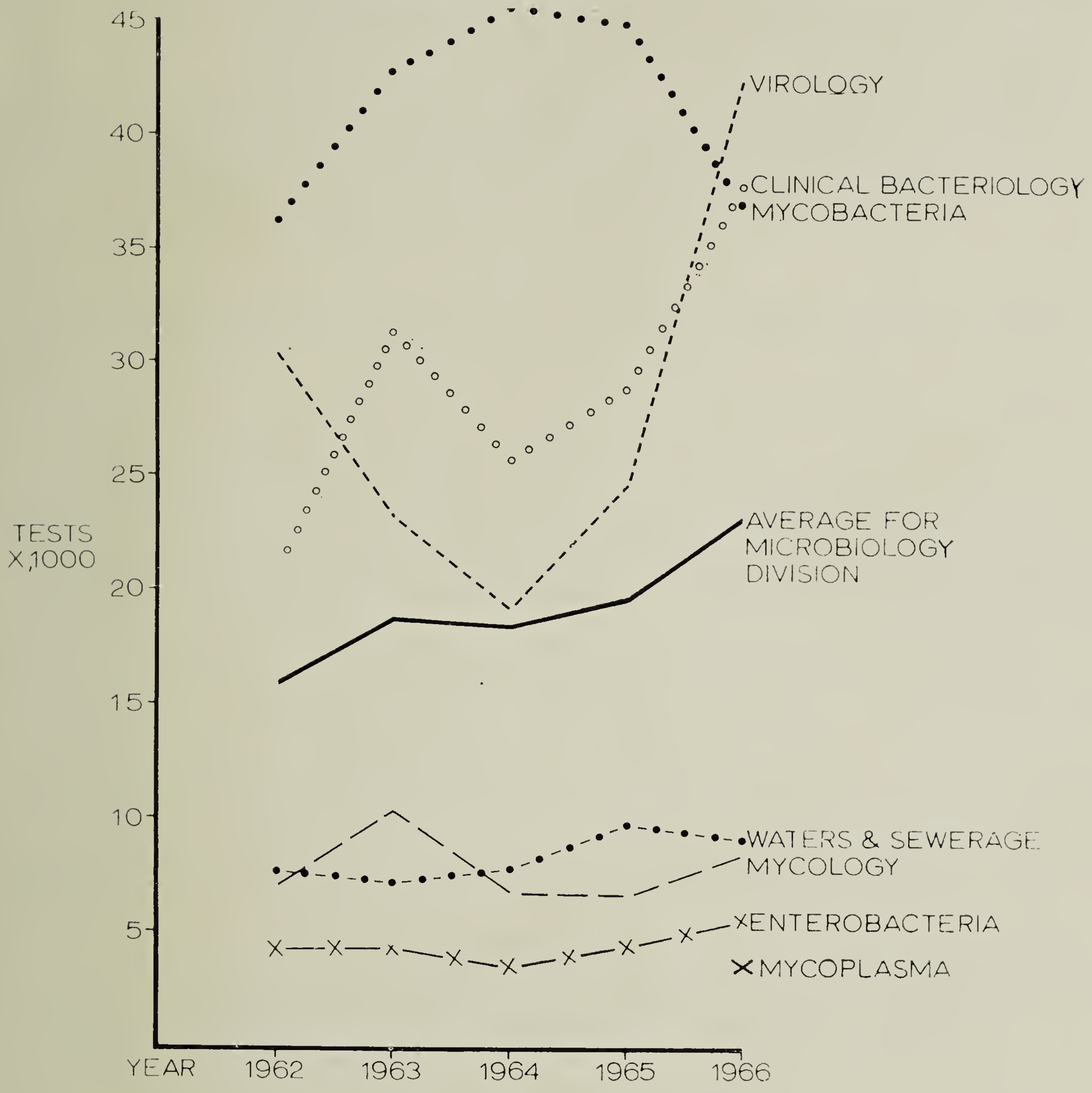
Pathogenic aspergilli were isolated from eleven patients—the majority were probably associated with allergic lesions but on one occasion mycelium was demonstrated in lung biopsy material. The results obtained with gel-diffusion techniques correlated well with isolations.

Routine bacteriology swabs, which were examined for unsuspected fungal pathogens, yielded a positive rate of 22 per cent. Similarly, vaginal swabs provided a 14 per cent. positive rate.

The laboratory was responsible for the course on Mycology to students at the Institute of Medical Technology.

FIGURE I

WORK OF MICROBIOLOGY DIVISION IN 5 YEAR PERIOD 1962-1966



3. *Biochemistry*

The year's work is summarised in Table 3 (Appendix). As might be expected, with the continued growth of the Sir Charles Gairdner Hospital and the country laboratory service, there has been a considerable increase in work—51.5 per cent. in tests and 47 per cent. in unit values in the year, as compared with 1965. There is no sign of any slackening in this rate of growth, and it must be emphasised that the increase applies both to number and degree of sophistication of tests done, a point sometimes not appreciated. With the growth of clinical biochemistry and complexity of diagnosis and treatment, the demands for more refined and delicate estimations increased rapidly.

Space, as might be expected in a growing service, is always at a premium. A move was made from a city laboratory in the year, and the division is now housed in two laboratories on the first floor of the Sir Charles Gairdner Hospital and in a wooden hut in the grounds—not the easiest of arrangements for administration.

Staff has been relatively static and satisfactory ; the growth of work will, in the future, be balanced, it is hoped, by automation without any great staff increases. It has become obvious that a greater degree of automation was an essential if the service was to continue efficiently, and advance planning and organisation of equipment has been moving to this end.

Control of the reliability of methods is of the utmost importance in a routine biochemical service. In fact, quality of result and speed of estimation are the two important factors that always have to be considered. A collaborative study was made by the hospitals and services in Perth of a variety of control samples, and the results analysed statistically. The results from this laboratory were satisfactory in all cases. A similar study conducted by the Australasian College of Pathologists throughout the Commonwealth showed our values in all of the twenty-two specimens to be within acceptable limits, a record that could not be claimed by many of the participating laboratories. It should be emphasised that these sera received no special attention but were analysed routinely.

One important facet of our work to which increasing attention has been paid, is the preparation of reagents and solutions for use in district laboratories. It is essential that all such reagents supplied should be within acceptable close limits of accuracy. In addition, unknown solutions are distributed to these laboratories for their analysis, to confirm the accuracy of their work. The increased supervision of this work has borne, and will continue to bear, dividends in the development of the service in the State.

Development work has continued when routine calls are not so demanding.

Protein Bound Iodine estimations are now done routinely, and the isolation of iodine and iron estimations is now satisfactory. Considerable attention has been given to Chromatography, while enzyme estimations such as Creatine Kinase have been introduced to the routine work.

However, much remains to be done if this department is to keep pace with modern growth and demands.

4. *Blood Collection*

Blood Collection

This service is shown separately this year as the same personnel are employed in the collection of specimens for two separate departments.

In common with other aspects of laboratory work, there has been a steady growth in the amount of work undertaken. (See Table 4 Appendix).

5. *Haematology*

The work of the department is summarised in Table 5 of Appendix, which shows a 19 per cent. increase in tests, and a 23 per cent. increase in the corresponding unit values over the work done in 1965. This increase is mainly due to greater use of the central laboratory by country centres, their requests being 62 per cent. higher than in 1965. There was a 12 per cent. increase in the numbers of tests from the Sir Charles Gairdner Hospital. These figures reflect the greater use made of the haematology section by doctors both locally and in country areas.

This increase in work has been accomplished without a concomitant growth of establishment of staff in this department, and consequently there is an increasing burden in the trained personnel. There is urgent need for the appointment of a permanent senior technologist in the Blood Bank, both in view of the volume of work, its increasing complexity, and the importance and responsibility of that work.

During November this department co-operated in the Busselton Survey, as a result of which ABO and Rhesus blood groups were determined on 3,476 persons. This work has not been included on the summary breakdown of departmental work. The results are still to be analysed.

The increasing work has also provided problems of space. This has been eased by the purchase of a laboratory hut adjacent to the hospital, in which routine work is performed. The hut, however, allows little room for expansion. Special investigations and the blood banking procedures remain centred in the main hospital block.

The only changes of note in the nature of the work undertaken are—

(a) Introduction of a service for screening obstetric patients for the presence of maternal antibodies. Although the majority of antibodies that occur in this group are anti-Rh.o., cases of sensitization to other blood antigens occur. The screening procedure is therefore being applied to all pregnant cases referred, and not only to Rh.o negative women. When antobodies are detected, titres are recorded and serial measurements throughout pregnancy indicate progressive sensitization.

(b) In all cases cross-matched for transfusion of blood, the recipient is now routinely being screened for the presence of serum antibodies, of either natural or immune type. So far, this has detected eight patients with antibodies, thus facilitating choice of blood for transfusions. In two of these the antibodies were weak natural antibodies, and in one the antibodies had evidently resulted from a transfusion many years previously.

General Points

Dr. D. G. Kennett undertook responsibility for surveillance of special work, bone marrows, etc., during the year.

Mr J. Neal, Senior Technologist, attended the 11th International Congress of Haematology and Blood Transfusion in Sydney.

Problems for the Future

Equipment for our present routine investigations is adequate. However, it is necessary to consider automation in the routine laboratory to handle the increasing volume of work, and the use of further specialized techniques, in particular, radio isotope studies, in the investigation of haematologic problems, is becoming a necessity. Such techniques are now more or less standard in any modern haematology laboratory. Their introduction to this laboratory requires capital expenditure for new equipment, advanced training of staff, and if possible, the provision of more laboratory space.

There is no doubt that the haematology division is at present only undertaking very routine and " bread and butter " work. Diversification, in the interests of patients, is essential.

6. *Serology*

The work of this laboratory is set out in Table 6 (Appendix) and shows an increase of 14 per cent. on that of 1965.

Venereal Disease (*Treponemal*)

Requests for these tests increased by 10.7 per cent. in 1966. Our routine did not change—a Kolmer Cardiolipin Wassermann, a Reiter Protein C.F. Test and a V.D.R.L. Flocculation (tube) test being done on all sera. Where the serological findings were consistently at variance with the clinical picture, at the request of medical officers, sera were sent to the V.D. Reference Laboratories at the Whitechapel Clinic, London, for T.P.I. and other tests. We are indebted to Dr. Wilkinson for swift, ready help.

The numbers of tests now routinely requested, plus intermittent " Surveys ", are sufficient to justify an automated system, and the feasibility of this is now being studied.

Venereal Disease (*Neisserian*)

There was a 9.2 per cent. increase in gonococcal C.F. Tests. These are carried out because they are requested ; we prefer to avoid stating the significance of our findings.

Aspergillosis

Agar gel tests using commercially available antigens (Bencard 1 and 2) are now done routinely.

Aspergillosis antibodies were demonstrated in 9 cases ; two of these did not show confirmatory clinical signs.

Psittacosis and Q. Fever

Because of the rather insidious nature of these diseases, screening commenced in September, 1966 of all sera submitted to us for routine bacterial agglutination tests. By this, two cases of psittacosis were discovered serologically, one from Geraldton and the other from Narrogin. In addition, one case of psittacosis and three of Q. Fever were confirmed serologically on blood specimens sent in routinely for virus serology. These four specimens were submitted by Fremantle Public Hospital.

Brucellosis

791 sera were examined. Of these—

1 showed standard agglutination at 1/400
1 showed standard agglutination at 1/800
These came from Manjimup and Albany.

Leptospirosis

10 cases were diagnosed or confirmed, serologically.

Survey (*Busselton*)

347 sera were received. Antibodies of the following diseases were sought : Brucellosis, Leptospirosis (4 serotypes), Q. Fever, Psittacosis and Toxoplasmosis. One serum showed a titre of 1:64 to Psittacosis and another a similar titre to Q. Fever.

Echinococcus and Mycoplasma pneumoniae C.F. tests are proceeding.

Virus, etc. Serology

M. Influenzae " A " C.F.T.—Thirteen cases with diagnostic rise in titre (paired specimens) (eight cases from a private practitioner, five cases from a Naval Station) ; six single specimens with titre + 1 : 128 (five from Royal Perth Hospital, one from Sir Charles Gairdner Hospital).

M. parainfluenzae 1—One case with diagnostic rise in titre (paired specimens) from a general practitioner.

Respiratory Syncytial Virus—One case with diagnostic rise in titre (paired specimens) from Repatriation General Hospital.

Cold Agglutinins—One single specimen + 1 : 64 from Sir Charles Gairdner Hospital ; One single specimen + 1 : 32 from Sir Charles Gairdner Hospital ; two cases with fourfold drop in titre (paired specimens)—one case from outside and one case from Sir Charles Gairdner Hospital.

Streptococcus M.G.—One case with diagnostic drop in titre (paired specimens) from the Repatriation General Hospital.

Mycoplasma—One case with diagnostic rise in titre from Sir Charles Gairdner Hospital.

Rubella—Three cases involving paired specimens :—

One case from Princess Margaret Hospital (1st specimen Negative, 2nd specimen + 1 : 8) ; one case from outside (1st specimen Negative, 2nd specimen + 1 : 16).

Note—This is the first time that Rubella and M. pneumoniae antibodies have been sought here.

Pregnancy Tests

We use U.C.G. tests routinely ; toad tests have not been abandoned but are run in parallel. Although more trouble they are less sensitive and we believe they complement the very sensitive immunological test.

For this reason, although we issue U.C.G. Kits to Branch Laboratories for urgent cases, we require an aliquot of the specimen, and the result obtained in the Branch Laboratory, to be sent back to Central Laboratories for toad test wherever possible, without further cost to the patient. The correlation has been very good, but the small proportion which are discrepant merit the cost, time and effort involved.

Staff

This comprised :—

One Senior Technologist
One Technologist
Two Laboratory Assistants
Three Laboratory Attendants
One Typist.

Tours

No member of the Serology staff travelled inter-State or abroad during 1966. Arrangements were put in hand for one Senior Technologist to attend a Cell Culture course in Melbourne with a view to setting up routine chromosome studies.

Forensic

No new developments, but a slight increase in the volume of work can be reported.

7. *Departments of Morbid Anatomy and Cytology*

Tables 7 (a) and 7 (b) of the Appendix show details of the work done in 1966. The work of the Morbid Anatomy department increased by 17.8 per cent. due mainly to the larger number of forensic autopsies done, and, to a lesser extent, to an increase in surgical biopsy work.

The Cytology department processed much the same number of slides as in 1965, but the cases screened increased by 16.9 per cent. The discrepancy was due to a drop in the number of slides prepared for teaching and similar purposes.

Morbid Anatomy

Staff—Through most of the year, work was hampered by staff shortages, both professional and technological. There was no permanent Head of the departments from the beginning of the year until late September when Dr. V. Blackman arrived from the United Kingdom to fill this post.

The increasing forensic load necessitated the recruitment of another pathologist for this work, and Dr. D. Hainsworth arrived in August, also from the United Kingdom. He had, until emigrating, been a lecturer in forensic medicine at Leeds University. These professional appointments did no more than keep pace with the increasing work load, and unfortunately there is no evidence that this has stabilised. Trained pathologists are too thin on the ground in this laboratory.

Technological staff was in short supply, and due to this shortage, liable to be switched from department to department or to district laboratories far too frequently for efficiency. Reliance again had often to be placed on relatively untrained personnel to enable work to go forward without undue delay.

Working Space—This was as cramped as ever, The temporary hut is still in use without any expansion of space. It is still far too hot in the summer, and the promised air conditioning has not materialised to date.

Equipment—A third tissue processor was acquired this year together with a slide dryer. A projection microscope was also acquired—this has more than satisfied a real need and has enabled joint clinico-pathological conferences and slide teaching sessions to be held routinely. Equipment for country post-mortems has been ordered for branch laboratories in the principal centres of the State so that autopsies can be performed in these areas without the necessity of carrying large amounts of equipment from Perth.

Scope of Work—An important step was the organisation in October of weekly clinico-pathological conferences on autopsy and other material which the members of the clinical staff of the Sir Charles Gairdner Hospital attend. These have proved popular and provide a link with the staff of the hospital which can do nothing but good for the laboratory.

A slide seminar weekly for pathologists has also been started. At this, the interesting and unusual material from the previous week is demonstrated, after each pathologist has had the opportunity to see the slides and form an opinion.

During the year, also, diversification of special staining techniques and specialised autopsy procedures went ahead. The laboratory can now undertake a fairly extensive range of special staining techniques and histo-chemical examinations.

Interesting cases seen during the year include—

Three cases of cryptococcosis. Two of these cases had primary pulmonary torulomas which were detected on routine chest radiography. The third patient developed cryptococcal meningitis from which he subsequently died. A further patient was found to have a thymoma, also first detected on routine chest radiography. This woman was asymptomatic, and has shown no evidence of myaesthenia gravis since operation.

Another patient, a man of 33 years, developed a primary aspergillus fungal infection of the lung which caused repeated haemorrhage. A large pulmonary aspergilloma was subsequently resected.

A 70 year old man presented with a sacral tumour which he had noticed for several months. Biopsy of this lesion showed it to be a chordoma. This is of interest since these tumours are believed to arise from embryonic notochord remnants which, in this patient, had evidently remained dormant for many years.

Forensic Pathology

During the year a considerable re-organisation of the work of this section could be undertaken. With the recruitment in the United Kingdom of a forensic pathologist, Dr. D. Hainsworth, a greater proportion of the medico-legal autopsies could be done by staff of the Public Health Laboratory Services, even though the mortuary of the Royal Perth Hospital was still used. It will be noted that numbers of forensic autopsies quadrupled compared with 1965, solely due to this re-organisation.

At present, Perth medico-legal routine autopsy work is shared by Dr. Pearson and Dr. Hainsworth, while the occasional request for specialised assistance from the rest of the State is met alternately by the Director, Dr. W. Laurie, and Dr. Hainsworth. It is hoped that such calls from relatively distant places will be restricted to subjects that really do need expert advice. With the present travel problems, one autopsy could lead to the absence from Perth of a specialised officer for several days, to the detriment of his more voluminous work in that city.

It is expected that a steady growth will occur in the number of autopsies handled by staff of this service in the future.

Dr. Laurie has retained his interest in general liaison with the police and other bodies interested in medico-legal problems, and has overseen to a large extent the serological and similar problems connected with this work.

A summary of serological work undertaken appears in the report on the Serological Section.

Cytology

The total number of units of work fell slightly in 1966 compared with 1965, but the work itself actually increased, with the fall being due to cutting-down of the making of extra slides for teaching purposes.

Due to wide and sometimes alarmist publicity there is an increasing proportion of cervical smears coming from the country areas : it is disappointing indeed that more use is not made of sputum investigation in patients distant from special chest investigation units since sputum examination is an easy and quick method of examination for lung cancer compared with alternative methods of investigation which require special skill and equipment. This is not true of cervical cancer where the practitioner in his own surgery can easily carry out a visual examination and not unusually makes the diagnosis, with the cervical smear being used for confirmation.

The two nightmares of the cytologist are the false-negative report, and the false-positive report. The first may cost the patient his or her life while the second will cost the patient peace of mind, and even his or her life from an unnecessary operation. To reduce the number of false-positive diagnoses both in sputum and in cervical smears we insist on all cancer diagnosis being confirmed by two medical cytologists before a report is sent out. It is even more difficult to reduce the number of false-negative reports. All slides reported as negative are screened by one medical cytologist, but it would be impracticable and should be unnecessary for two medical cytologists to check each negative finding.

Although the numbers of cervical smear examinations continue to rise every year, the total, taking into account other centres doing this work, still represents only a tiny proportion of the 239,000 women now at risk in Western Australia. This total includes all women 21 years of age and above : it is a mistake to limit examinations to women 30 years of age and above.

This matter of educating the medical public to the value of sputum cytology is of pressing importance when one realises the large number of individuals at risk and when one realises that, numerically at least, lung cancer is a much more serious problem than uterine cancer, and is a problem increasing in importance every year, with the difference in sex incidence slowly disappearing.

IV. BRANCH LABORATORIES

Table 1(*b*) of the Appendix summarises the work done in the various Branch Laboratories for 1966. The increase of 20.6 per cent. in unit values for work done in 1966 as compared with 1965 is a little less than the increase of 1965 over 1964. This is partly because the older laboratories are beginning to stabilise work loads and partly because the shortage of technologists in the country branches is so serious that it is not possible for the staff to carry all the work load, resulting in a shunting-back of less urgent work to the Central Laboratories. This unsatisfactory arrangement merely shifts the load to an equally hard-pressed central department. The only satisfactory solution is that we obtain more trained staff for the country, but, even when this is authorised, recruitment is difficult as the country branches have few attractions compared with the fleshpots of Perth.

In this year, 1966, Port Hedland laboratory had to be up-graded to senior level because of the marked expansion of Port Hedland, otherwise there has been no expansion of the country laboratory service to new areas although there still remain some worrying gaps in the coverage we provide,

V. RESEARCH

In previous Annual Reports it has been pointed out that research work is essential as a means of improving old techniques and of introducing and evaluating new ones. This " developmental work " is a necessary part of the work of all sections of the laboratories excepting the country laboratories which cannot afford the time or the equipment. In the 1965 Annual Report examples were given of important improvements in techniques which had resulted from developmental work.

Among newer improvements to be mentioned we would include : continuing work on improvement of media for entero-pathogen investigation : standardization of the batteries of media for the growth of tubercle-like organisms : comparison of new types of pregnancy tests with the older toad test : and investigation of sudden deaths in young asthmatics.

As stated in the 1965 Annual Report, the complex method of heart examinations which began as a research project is now regarded as an essential part of heart investigations in all obscure cases of sudden death.

In the field of haematology the chromosome work has now passed the experimental stage and is in full use.

VI. PUBLICATIONS

During 1966 the pressure of work was such as not to allow of any time being available for the preparation of papers for publication. As a result only two papers appeared during the year, namely the publication by the late Dr. Nicholas Kovacs on his important contribution " Epidemiological and Clinical Aspects of ' Anonymous ' Mycobacteria ", published in the Bulletin of the International Union against Tuberculosis, September 1966, Vol. 37, and the publication by Dr. W. Laurie of " Sputum Cytology in the Diagnosis of Bronchial Carcinoma ", Medical Journal of Australia, 5th February, 1966, Vol. I, p. 205.

VII. TEACHING

This continues to be a significant demand on our time, but in view of its importance we have endeavoured not to cut it down.

VIII. SURVEYS

The carrying out of surveys is of considerable importance especially in areas where the pattern of sickness is not yet clear, as in the North. Unfortunately, here again shortage of staff interfered with this work and it was possible only to co-operate in two surveys during the year, namely the investigation into the health of infants and children in the Derby area, carried out in co-operation with the Department of Child Health. Possibly the most striking finding was the high incidence of Salmonellae not only in the population but in various other forms of life especially lizards—a delicacy in the aboriginal diet, and, strangely, in the faeces of a pet python. We also participated in a Busselton Health Survey, to be reported more fully in the next Annual Report.

IX. ACKNOWLEDGEMENTS

Our colleagues abroad continue to supply much-appreciated help in difficult cases. We are once more indebted to the Sloan-Kettering Institute of New York, to the workers of the Public Health Laboratory Services at Colindale, England, and to so many other workers. Mr. G. O. Walters and the staff of the Mental Health Services Workshops as usual provide a first-class service in much of the routine cleaning and preparation of laboratory equipment and glassware.

Finally, I would again point out that the great volume of work passing through the department is accomplished only becasue of the efficiency of members of the laboratory service, and especially by the technologists working under difficulties in the country laboratories.

Wm. LAURIE, D.S.O., M.D., T.D.D., M.C.P.A.
Director, Public Health Laboratory Services.

Appendix

Table 1 (*a*)

PUBLIC HEALTH CENTRAL LABORATORIES—SUMMARY OF WORK DONE, 1966

	Source								Total 1966		Total 1965		1966 Increase	
	State		C'wealth		S.C.G.H.		Others							
	Tests	Unit Values	Tests	Unit Values	Tests	Unit Values	Tests	Unit Values	Tests	Unit Values	Tests	Unit Values	Tests	Units
													%	%
Microbiology														
A. Clinical Bacteriology	19,301	137,899	4,158	25,796	12,470	67,377	1,906	11,188	37,835	242,260	28,834	201,550	31.2	20.2
B. Waters and Sewerage	9,129	91,290	....	....	....	....	....	....	9,129	91,290	9,752	97,520		
C. Enteric Diseases	5,092	66,060	310	3,432	260	2,381	....	....	5,662	71,873	4,239	56,167	33.6	28
D. Mycobacteria	....	....	31,687	184,883	....	....	....	....	31,687	184,883	44,615	284,005		
E. Mycology	8,582	56,946	....	....	....	....	....	....	8,582	56,946	6,650	44,360	29.1	28.4
F. Virology	42,663	312,534	....	....	....	....	....	....	42,663	312,534	24,777	157,722	72.2	98.2
Biochemistry	11,920	164,301	3,720	42,010	24,790	213,144	1,305	12,839	41,735	432,294	28,065	296,144	48.7	46
Haematology	23,503	119,486	10,440	41,574	45,971	180,661	4,683	21,857	84,597	363,578	71,102	294,998	19	23.2
Serology	49,071	319,259	3,799	26,029	1,881	14,976	1,600	18,120	56,351	378,384	49,452	333,451	14	13.5
Histopathology														
A. Histopathology and Morbid Anatomy	8,831	190,650	1,563	23,445	3,231	71,220	3,495	52,425	17,120	337,740	15,998	286,590	7.1	17.8
B. Cytology	3,566	53,490	1,852	27,780	2,608	39,120	5,244	78,660	13,270	199,050	13,711	205,665		
Total	181,658	1,511,915	57,529	374,949	91,211	588,879	18,233	195,089	348,631	2,670,832	297,195	2,258,172	17.3	18.3

Table 1 (*b*)

PUBLIC HEALTH BRANCH LABORATORIES—SUMMARY OF WORK DONE, 1966

	Total—1966		Total—1965		Increase—1966	
	Tests	Unit values	Tests	Unit values	Tests	Unit values
					%	%
Albany	30,823	122,020	31,991	101,978	....	19.7
Bunbury	35,711	225,465	32,446	208,428	10.1	8.2
Busselton	7,280	30,902	7,719	35,066	....	....
Carnarvon	2,406	29,792	2,258	32,986	6.6	....
Claremont	24,827	99,064	13,257	59,670	87.3	66
Derby	13,997	76,034	10,893	60,231	28.5	26.2
Geraldton	18,497	92,229	13,250	84,337	40	9.4
Manjimup	9,531	42,629	7,359	34,544	30	23.4
Narrogin	14,812	74,762	10,848	57,150	36.5	30.8
Northam	17,570	66,019	15,099	52,388	16.4	26
Port Hedland	5,851	36,614	4,311	25,689	35.7	42.5
Wooroloo	9,677	60,453	9,271	53,883	4.4	12.2
Wyndham	5,263	31,400	2,602	26,856	102.2	16.9
Merredin	3,738	17,621	....	....	Opened	May 1966
Total	199,983	1,005,004	161,304	833,206	24	20.6

Table 2 (*a*)

CLINICAL BACTERIOLOGY—WORK DONE 1966

	Source				1966 Total	1965 Total	1966 Increase
	State	Common-wealth	Hospital	Others			
							%
Animal Inoculations	88	....	....	....	88	94	
Blood Specimens	111	59	213	9	392	193	103.1
C.S.F. Specimens	63	4	168	9	244	135	80.7
Faeces Specimens	1,744	4	29	....	1,777	1,073	65.6
Foodstuffs: Fresh	303	8	....	....	311	473	
Tinned or Frozen	63	3	....	....	66	163	
Sensitivity Tests	3,378	919	2,536	551	7,384	7,236	2.0
Serous Effusions	27	34	228	18	307	322	
Sputum	267	535	3,526	104	4,432	4,660	
Swabs all Sources	8,074	388	1,145	174	9,781	2,364	More than 4x.
Urine Examinations	640	895	4,208	1,019	6,762	6,731	0.5
Vaginal Specimens	817	46	130	3	996	1,314	
Venereal Diseases	3,302	1,235	64	....	4,601	3,502	31.4
Water	44	13	12	....	69	69	
Others	380	15	211	19	625	505	23.8
Totals—							
Tests	19,301	4,158	12,470	1,906	37,835	28,834	31.2
Unit Values	137,899	25,796	67,377	11,188	242.260	201,550	20.2

Table 2(*b*)

WATER AND SEWERAGE SURVEYS—WORK DONE 1966

	Source				1966 Total	1965 Total	1966 Increase
	State	Common-wealth	Hospital	Others			
							%
Water: A. Drinking	6,509	....	....	....	6,509	5,745	13.3
B. River, Ocean	2,110	....	....	....	2,110	2,043	3.3
C. Sewerage	309	....	....	....	309	425	
D. Membrane Filters	188	....	....	....	188	1,504	
Cool Drinks	13	....	....	....	13	35	
Total:							
Tests	9,129				9,129	9,752	
Unit Values	91,290				91,290	97,520	

Table 2 (*c*)

ENTERIC DISEASES LABORATORY—WORK DONE 1966

	Source				1966 Total	1965 Total	1966 Increase
	State	Common-wealth	Hospital	Others			%
Animal Inoculation	....	....	....	....	....	1	
Blood Specimens	....	....	....	....	....	....	
Faeces specimens	3,556	288	259	....	4,103	3,319	23.6
Foodstuffs: Fresh	94	1	....	....	95	160	
Frozen/Tinned	124	....	....	....	124	268	
Fertilisers	30	....	....	....	30	....	
Sensitivities	180	2	1	....	183	17	*more than 10x.
Sputum	....	....	....	....	....	2	
Others	1,108	19	....	....	1,127	472	138.8
Total:							
Tests	5,092	310	260	....	5,662	4,239	33.6
Unit Values	66,060	3,432	2,381	....	71,873	56,167	28.0

* In 1965 the Sensitivities were done at General Bacteriology.

Table 2 (d)

TUBERCULOSIS SECTION—EXAMINATIONS IN 1966

Type of Examinations		1966 Total	1965 Total	1966 Increase
				%
Sputum :				
Direct Smears	42	24,006	25,439	
Centrifuged Deposits	11,922			
Cultures	11,922			
Direct Guinea Pig inoculations	120			
Gastric Contents :				
Centrifuged Deposits	262	526	745	
Cultures	262			
Direct Guinea Pig inoculations	2			
Laryngeal Swabs :				
Centrifuged Deposits	1	2	20	
Cultures	1			
Direct Guinea Pig inoculations	—			
Pleural Fluids :				
Sulas				
Centrifuged Deposits	113	334	423	
Cultures	113			
Direct Guinea Pig inoculations	108			
Bronchial Lavage :				
Centrifuged Deposits	22	44	12	More than 3½x
Cultures	22			
Direct Guinea Pig inoculations	—			
Cerebral Spinal Fluid :				
Direct Smears	15	46	30	53.3
Centrifuged Deposits	15			
Cultures	16			
Direct Guinea Pig inoculations				
Urine :				
Direct Smears				
Centrifuged Deposits	586	1,758	2,151	
Cultures	586			
Direct Guinea Pig inoculations	586			
Miscellaneous :				
Direct Smears	11	1,953	1,806	8.1
Centrifuged Deposits	804			
Cultures	804			
Direct Guinea Pig inoculations	334			
Smears for M. Leprae		28	52	
Virulence Tests		....	96	
Sensitivity Tests		1,615	1,421	13.6
Confirmation Tests		1,375	1,398	
Total Examinations	Tests	31,687	33,593	
	Unit Values	184,883	197,387	
Improvement Work	Tests	5,152	11,022	
	Unit Values	41,260	86,618	
Total	Tests	36,839	44,615	
	Unit Values	226,143	284,005	

Table 2 (*e*)

MYCOLOGY—WORK DONE 1966

	Source				1966 Total	1965 Total	1966 Increase
	State	Common-wealth	Hospital	Others			
							%
Collection of Specimens	859				859	564	52.3
Sputum	....				....	52	
Swabs	3,271				3,271	2,646	23.6
C.S.F. and Other Fluids	....				....	....	
Skin, Hair, etc.	2,570				2,570	1,802	42.6
Special Examinations	1,079				1,079	878	22.9
Cervical and Other Smears	12				12	....	
Animal Inoculations	12				12	8	50.0
Mycological Smears	....				...	6	
Sensitivities	779				779	694	12.2
Total:							
Tests	8,582				8,582	6,650	29.1
Unit Values	56,946				56,946	44,360	28.4

Table 2 (f)

VIROLOGY SECTION—WORK DONE 1966

	Source				1966 Total	1965 Total	1966 Increase
	State	Common-wealth	Gairdner Hospital	Others			
							%
Preparation of Inocula	3,263				3,263	1,365	139.1
Tissue Culture	11,702				11,702	4,841	More than 2x.
Egg Inoculation	2,271				2,271	1,029	120.7
Animal Inoculation	9,448				9,448	5,635	67.7
Neutralisation	8,676				8,676	7,792	11.3
Haemadsorption	776				776	590	31.5
Haemagglutination and inhibition	3,413				3,413	1,927	77.1
Sterility Tests	2,457				2,457	1,124	118.6
Others	657				657	474	38.6
Total :							
Tests	42,663				42,663	24,777	72.2
Unit Values	312,534				312,534	157,722	98.2

Table 2 (*f*)—*continued*

Tests	No. of Tests
Preparation of Inocula—	
Faeces, Sputum P.M.	2,153
Chick Embryo (Cam-yolk sac)	495
Suckling mice	357
Throat washings	95
Sera	163
Diagnostic—	
Tissue culture	11,702
Chick Embryo—	
Amniotic	1,560
Yolk Sac/CAM	535
Allantoic	176
Animal Inoculation—	
Mice	9,448
Neutralization—	
Neutralization tests	36
Serum neutralization	8,640
Haemagglutination—	3,413
Haemadsorption—	776
Sterility Tests—	2,457
Others—	
Celloidan fixation	14
Inclusion bodies	202
Yolk sac smears	163
Preparation of Antigen—Toxoplasma	7
" " " Virus	45
Venipunctures	75
Conjunctival Scrapings	77
Miscellaneous Cell Lines—Human	38
" " " Animal	36
Total	42,663

Preparation and Maintenance—

3,168	T.C. Bottles		
33,929	T.C. Tubes	Unit Values for Routine work	287,035
986	doz. Embryonated Eggs	Unit Values for Preparation and maintenance	25,499
105	Red Cells		
90,300	Calibration of Pipettes	Total	312,534
1,560	Filing of Material		

Unit Values—25,499 units.

Number of tests carried out on specimens from—	
C.I.B.	1,174
Sir Charles Gairdner Hospital	2,147
Royal Perth Hospital	2,969
Princess Margaret Hospital	3,585
Public Health Department	8,987
Commonwealth	1,828
Others	21,973
Total	42,663

Table 3

BIOCHEMISTRY DEPARTMENT—WORK DONE, 1966

Work Done	Source				1956 Total	1965 Total	1966 Increase
	State	Common-wealth	Gairdner Hospital	Others			
							%
Serum/Plasma Tests	5,015	3,586	23,892	1,194	33,687	22,254	51.4
C.S.F. Tests	116	12	201	8	337	265	27.2
Gastric Contents	....	....	3	....	3	4	
Effusions	....	8	44	2	54	56	
Urine Examinations	217	52	466	76	811	385	110.6
Metabolic Tests	14	5	107	4	130	85	52.9
Others (including blood collection)	6,558	57	77	21	6,713	5,016	133.8
Totals—Tests	11,920	3,720	24,790	1,305	41,735	28,065	48.7
Unit Values	164,301	42,010	213,144	12,839	432,294	296,144	46.0

Unit Values for routine work, including collection	....	343,746—increase	44.6%
,, ,, ,, work in Development Laboratory	....	76,548 ,,	*47.3%
,, ,, ,, preparation of Reagents	....	12,000 ,,	*83.5%

* In 1965 report the units for preparation of Reagents and the work in Development Laboratory are included for 7 months only, i.e., from June to December.

Table 4

BLOOD COLLECTION

	1966		1965	
	Collections	Units	Collections	Units
Biochemistry	6,475	32,375	4,795	23,975
Haematology	11,516	57,580	8,583	42,915
Total	17,991	89,955	13,378	66,890

Increase in—Collections ....}
Units ....} 34.5%

Table 5

HAEMATOLOGY DEPARTMENT—WORK DONE 1966

Tests Done	Source				1966 Total	1965 Total	1966 Increase
	State	Common-wealth	Gairdner Hospital	Others			
							%
Red Cells—							
Total levels	....	3	4	1	8	1,010	
Haematocrit	598	1,286	5,621	532	8,037	6,809	18
Absolute Values....	574	1,289	5,617	526	8,006	8,773	
Sedimentation	296	1,125	4,467	141	6,029	5,424	11.2
Film Examination	616	1,359	5,894	357	8,226	6,730	22.2
Fragility tests	2	....	2	....	4	4	
Reticulocytes	19	107	215	6	347	477	
Stipple cells							
Hb. levels	616	1,291	5,646	569	8,122	6,845	18.7
Platelets	374	652	2,201	339	3,566	3,248	9.8
White Cells—							
Total	466	1,117	4,862	416	6,861	5,884	16.6
Differential	466	1,124	4,860	363	6,813	5,765	18.2
L.E. Cells	20	16	101	18	155	85	82.4
Direct Eosinophil count	11	3	134	....	148	141	5
Blood Grouping—							
Major	3,639	38	792	372	4,841	1,724	180.8
Minor	3,639	38	792	372	4,841	1,713	182.6
Compatibility	3	136	2,441	....	2,580	2,660	
Rh Antibodies	267	...	4	524	795	502	58.4
Genotyping	29	....	3	17	49	1,271	
Bone Marrow Examination	8	3	31	5	47	72	
Vit. B12 Assay	180	139	126	86	531	356	49.2
Coagulation Tests—							
Prothrombin Time	127	684	1,976	22	2,809	2,698	4.1
Bleeding Time	3	5	58	2	68	83	
Clotting Time	3	5	58	2	68	94	
Clot Retraction	1	2	15	...	18	31	
Others	30	18	51	13	112	120	
Totals—Tests	11,987	10,440	45,971	4,683	73,081	62,519	16.9
Unit Values	61,906	41,574	180,661	21,857	305,998	252,083	21.4

Table 6

SEROLOGY DEPARTMENT—WORK DONE 1966

Work Done	Source				1966 Total	1965 Total	1966 Increase
	State	Common-wealth	Gairdner Hospital	Others			
							%
Treponemal Tests	24,145	1,946	581	....	26,672	24,090	10.7
Gonococcal Tests	1,937	327	26	....	2,290	2,097	9.2
Hydatid Tests	128	7	14	....	149	172	
Bacterial agglutinations	6,393	386	261	....	7,040	6,103	15.4
Rheumatic Tests	2,864	668	365	373	4,270	3,815	11.9
Leptospiral Tests	2,019	15	29	....	2,063	1,154	78.8
Fungal, Viral, Rickettsial and Protozoal Tests	7,801	431	537	....	8,769	7,378	18.9
Hormone Tests	1,265	18	44	1,227	2,554	2,145	19.1
Medico-Legal Tests	2,232	....	....	....	2,232	2,142	4.2
Others	287	1	24	....	312	356	
Totals—Tests	49,071	3,799	1,881	1,600	56,351	49,452	14.0
Unit Values	319,259	26,029	14,976	18,120	378,384	333,451	13.5

Table 7 (*a*)

HISTOPATHOLOGY AND MORBID ANATOMY—WORK DONE, 1966

Work Done	Source				1966 Total	1965 Total	1966 Increase
	State	Common-wealth	Gairdner Hospital	Others			
							%
Autopsies—							
Forensic	307	....	....	....	307	70	More than 4x.
Others	8	....	123	....	131	182	
Sections—							
Autopsy sp. Forensic	3,070	....	....	....	3,070	5,969	1.4
Autopsy sp. Others	1,543	....	1,441	....	2,984		
Biopsy specimens	1,471	1,563	1,641	3,495	8,170	7,518	8.7
Animals	237	....	....	....	237	61	3½x
Special Staining—							
Autopsy specimens	548	....	....	....	548	2,198	1.0
Biopsy specimens	1,553	....	....	....	1,553		
Frozen Sections	94	....	26	....	120		
Total—Examinations	8,831	1,563	3,231	3,495	17,120	15,998	7.1
Units	190,650	23,445	71,220	52,425	337,740	286,590	17.8

Table 7 (*b*)

CYTOLOGY—WORK DONE, 1966

Work Done	Source				1966 Total	1965 Total	1966 Increase
	State	Common-wealth	Gairdner Hospital	Others			
							%
Exfoliative Cytology	3,566	1,852	2,608	5,244	13,270	13,711	
Total—Examinations	3,566	1,852	2,608	5,244	13,270	13,711	
Units	53,490	27,780	39,120	78,660	199,050	205,665	

	No. of slides, 1966	No. of slides, 1965	Increase, 1966	
Lung specimens	3,779	3,233	16.9%	20.9%
Cervical specimens	6,203	4,893	26.8%	
Other specimens	785	780	0.6%	
Special slides	2,503	4,805		
	13,270	13,711	16.9%	

Salmonella Diagnostic and Reference Laboratory

PUBLIC HEALTH LABORATORY SERVICE

PERTH – WESTERN AUSTRALIA

Isolations of Salmonella, 1955-1966

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thompson	1960
typhi	1955, 1956, 1957, 1958, 1959, 1960, 1961, 1962, 1963, 1964, 1965, 1966
typhimurium	1955, 1956, 1957, 1958, 1959, 1960, 1961, 1962, 1963, 1964, 1965, 1966
urbana	1961, 1962, 1964, 1965, 1966
vejle	1958
wandsbek	1962, 1964, 1965
wandsworth	1962, 1963, 1964, 1966
wayeross	1960, 1961
welikade	1964, 1966
weltevreden	1961, 1966
worthington	1957, 1958, 1959
zehlendorf	1964

SALMONELLA SEROTYPES ISOLATED FROM VARIOUS SOURCES

Serotype	Human			Foods				Animals, Reptiles, Birds, Fish, etc. (Other Than Human Food)	Miscellaneous	Total Isolations
	Cases	Faeces	Miscellaneous	Meat	Fish	Egg	Vegetable			
Year 1955										
adelaide	1	1	....	....	....	....	....	....	....	1
anatum	1	1	....	....	....	....	....	....	....	1
bovis-morbificans	1	1	....	....	....	....	....	....	....	1
cholerae-suis	1	....	1	....	....	....	....	....	....	1
paratyphi—A	2	1	3	....	....	....	....	....	....	4
typhi	6	4	4	....	....	....	....	....	....	8
typhimurium	2	2	....	....	....	....	....	....	....	2
Total Isolations	....	10	8	....	....	....	....	....	....	18
Total Cases	14	....	....	....	....	....	....	....	....	....
Year 1956										
adelaide	1	1	....	....	....	....	....	....	....	1
anatum	1	1	....	....	....	....	....	....	....	1
bovis-morbificans	2	2	....	....	....	....	....	....	....	2
derby	....	....	....	....	....	....	....	....	1	1
new-brunswick	....	....	....	....	....	1	....	....	....	1
orion	....	....	....	....	....	1	....	....	....	1
paratyphi—A	1	1	....	....	....	....	....	....	....	1
paratyphi—B	2	1	2	....	....	....	....	....	....	3
poona	....	....	....	....	....	1	....	....	....	1
typhi	5	10	2	....	....	....	....	....	....	12
typhimurium	2	2	....	....	....	....	....	....	1	3
Total Isolations	....	18	4	....	....	3	....	....	2	27
Total Cases	14	....	....	....	....	....	....	....	....	....
Year 1957										
anatum	....	....	....	....	....	1	....	....	....	1
berta	....	....	....	....	....	....	....	....	1	1
birkenhead	....	....	....	....	....	....	....	....	1	1
butantan	....	....	....	....	....	....	5	....	....	5
cambridge	....	....	....	....	....	....	....	....	3	3
derby	....	....	....	....	....	7	....	1	....	8
edinburgh	....	....	....	....	....	....	2	....	....	2
give	1	5	....	....	....	2	....	....	....	7
montevideo	....	....	....	....	....	1	....	....	....	1
muenchen	1	1	....	....	....	1	....	....	....	2
newport	3	3	....	....	....	1	....	....	....	4
nyborg	....	....	....	....	....	....	....	1	....	1
oranienburg	....	....	....	....	....	27	....	2	1	30
paratyphi—B	....	....	....	....	....	....	1	....	....	1
perth	....	....	....	....	....	....	3	....	....	3
pullorum	....	....	....	....	....	80	....	....	....	80
san-diego	....	....	....	....	....	....	....	1	....	1
typhi	4	5	1	....	....	....	....	....	....	6
typhimurium	3	6	....	....	....	11	....	....	5	22
worthington	....	....	....	....	....	1	....	....	....	1
Total Isolations	....	20	1	....	....	132	11	5	11	180
Total Cases	12	....	....	....	....	....	....	....	....	....
Year 1958										
adelaide	2	2	....	....	....	6	....	7	....	15
agodi	....	....	....	....	....	....	....	1	....	1
amager	....	....	....	....	....	....	....	2	....	2
anatum	....	....	....	....	....	1	....	26	1	28
bareilly	....	....	....	....	....	1	....	1	....	2
birkenhead	....	....	....	....	....	....	....	1	....	1
bovis-morbificans	3	9	....	....	....	....	....	5	2	16
braenderup	....	....	....	....	....	....	....	7	....	7
bredeney	....	....	....	....	....	....	....	6	....	6

SALMONELLA SEROTYPES ISOLATED FROM VARIOUS SOURCES—*continued*

Year 1958—continued

Serotype	Human			Foods				Animals Reptiles, Birds, Fish, etc. (Other than Human Food)	Mis-cellaneous	Total Isolations
	Cases	Faeces	Miscel-laneous	Meat	Fish	Egg	Veget-able			
cambridge	....	....	....	....	....	....	....	4	....	4
chester	....	....	....	....	....	2	....	3	....	5
cholerae-suis	....	....	....	....	....	....	....	2	....	2
cubana	....	....	....	....	....	....	....	21	....	21
derby	....	....	....	....	....	4	....	15	....	19
eastbourne	1	1	....	....	....	....	....	....	....	1
emmastad	1	1	....	....	....	....	....	....	....	1
fremantle	1	1	....	....	....	....	....	....	....	1
give	....	....	....	....	....	2	....	22	1	25
halmstad	....	....	....	....	....	....	....	1	....	1
jangwani	....	....	....	....	....	....	....	1	....	1
kaapstad	....	....	....	....	....	....	....	....	1	1
kentucky	....	....	....	....	....	....	....	1	....	1
lexington	....	....	....	....	....	....	....	3	....	3
meleagridis	4	4	....	....	....	3	....	16	9	32
muenchen	....	....	....	....	....	....	....	1	....	1
muenster	....	....	....	....	....	1	....	....	....	1
new-brunswick	....	....	....	....	....	....	....	2	....	2
newington	....	....	....	....	....	....	....	2	....	2
newport	1	1	....	....	....	....	....	5	....	6
nyborg	....	....	....	....	....	5	....	3	1	9
oranienburg	....	....	....	....	....	8	....	6	....	14
orion	....	....	....	....	....	2	....	....	....	2
paratyphi—B	....	....	....	....	....	....	....	....	7	7
potsdam	....	....	....	....	....	1	....	....	....	1
pullorum	....	....	....	....	....	245	....	....	....	245
reading	....	....	....	....	....	1	....	....	....	1
saarbruecken	....	....	....	....	....	....	....	1	....	1
saint-paul	....	....	....	....	....	....	....	....	1	1
san-diego	....	....	....	....	....	....	....	3	....	3
selandia	....	....	....	....	....	....	....	1	....	1
senftenburg	....	....	....	....	....	3	....	14	2	19
taksony	....	....	....	....	....	....	....	7	....	7
typhi	19	41	14	....	....	....	....	....	21	76
typhimurium	1	6	....	....	....	110	....	40	10	166
vejle	....	....	....	....	....	1	....	1	....	2
worthington	....	....	....	....	....	1	....	23	....	24
Total Isolations	....	66	14	....	....	397	....	254	56	787
Total Cases	33	....	....	....	....	....	....	....	....	....

Year 1959

Serotype	Human			Foods				Animals Reptiles, Birds, Fish, etc. (Other than Human Food)	Mis-cellaneous	Total Isolations
	Cases	Faeces	Miscel-laneous	Meat	Fish	Egg	Veget-able			
adelaide	....	....	....	....	....	3	....	....	....	3
anatum	2	2	....	....	....	5	....	....	1	8
bovis-morbificans	2	2	....	....	....	5	....	....	....	7
chester	1	1	....	....	....	....	....	....	....	1
derby	....	....	....	....	....	4	....	....	2	6
fremantle	....	....	....	....	....	1	....	....	....	1
give	....	....	....	....	....	....	....	....	1	1
meleagridis	....	....	....	....	....	1	....	....	....	1
muenchen	3	3	....	....	....	....	....	....	....	3
muenster	....	....	....	....	....	1	....	....	....	1
onderstepoort	....	....	....	....	....	....	....	....	1	1
oranienburg	....	....	....	....	....	12	....	....	....	12
orientalis	....	....	....	....	....	....	....	....	1	1
orion	....	....	....	....	....	4	....	....	....	4
pullorum	....	....	....	....	....	237	....	....	....	237
senftenburg	1	1	....	....	....	....	....	....	....	1
typhi	9	19	4	....	....	....	....	....	....	23
typhimurium	22	34	....	....	....	98	....	....	....	132
worthington	....	....	....	....	....	6	....	....	....	6
Total Isolations	....	62	4	....	....	377	....	....	6	449
Total Cases	40	....	....	....	....	....	....	....	....	....

SALMONELLA SEROTYPES ISOLATED FROM VARIOUS SOURCES—*continued*

Serotype	Human			Foods				Animals, Reptiles, Birds, Fish, etc. (Other Than Human Food)	Miscel-laneous	Total Isolations
	Cases	Faeces	Miscel-laneous	Meat	Fish	Egg	Veget-able			
Year 1960										
adelaide	1	1	....	2	....	5	....	....	....	8
anatum	....	....	....	....	....	3	....	....	....	3
bareilly	....	....	....	....	....	....	3	....	....	3
birkenhead	....	....	....	....	....	....	....	1	1	2
bovis-morbificans	4	4	....	....	....	2	....	....	....	6
butantan	....	....	....	....	....	....	1	....	....	1
charity	....	....	....	....	....	....	....	....	1	1
chester	1	8	....	....	....	....	....	....	....	8
cholerae-suis	2	....	8	....	....	....	....	....	....	8
dahlem	1	1	....	....	....	....	....	....	....	1
derby	2	2	....	....	....	....	....	1	....	3
ferlac	....	....	....	....	....	....	1	....	....	1
hvittingfoss	....	....	....	....	....	....	2	....	....	2
kotte	....	....	....	....	....	....	2	....	....	2
meleagridis	....	....	....	....	....	3	....	....	....	3
muenchen	2	2	....	....	....	....	....	....	....	2
nchanga	....	....	....	....	....	....	1	....	....	1
newington	1	1	....	....	....	....	....	....	....	1
newport	....	....	....	....	....	....	3	....	....	3
onderstepoort	....	....	....	....	....	....	....	2	....	2
oranienburg	....	....	....	....	....	12	....	....	....	12
orientalis	....	....	....	....	....	....	....	1	....	1
paratyphi—B	....	....	....	....	....	....	2	....	....	2
potsdam	1	1	....	1	....	....	....	....	....	2
pullorum	....	....	....	....	....	49	....	....	....	49
reading	1	1	....	....	....	....	....	....	....	1
rubislaw	1	1	....	....	....	....	1	....	....	2
senftenburg	1	1	....	....	....	1	....	....	....	2
thompson	....	....	....	....	....	....	3	....	....	3
typhi	3	8	....	....	....	....	....	....	....	8
typhimurium	24	38	....	....	....	7	2	....	....	47
waycross	....	....	....	....	....	....	7	....	....	7
Total Isolations	....	69	8	3	....	81	29	5	2	197
Total Cases	45	....	....	....	....	....	....	....	....	....
Year 1961										
adelaide	2	2	....	....	....	5	....	1	....	8
anatum	1	1	....	....	....	1	....	1	....	3
angoda	....	....	....	....	....	....	10	....	....	10
ball	2	2	....	....	....	....	....	....	....	2
bareilly	....	....	....	....	....	1	16	....	....	17
bovis-morbificans	1	1	....	....	....	9	....	....	....	10
braenberup	....	....	....	....	....	....	1	....	....	1
chester	4	4	....	....	....	2	1	1	....	8
chingola	....	....	....	....	....	....	4	....	....	4
chittagong	....	....	....	....	....	....	17	....	....	17
cholerae-suis	....	....	8	....	....	....	....	1	....	9
decatur	....	....	....	....	....	....	....	1	....	1
derby	5	7	....	....	....	8	....	....	....	15
enteritidis	1	1	....	....	....	....	....	....	....	1
ferlac	....	....	....	....	....	....	26	....	....	26
hvittingfoss	....	....	....	....	....	....	1	....	....	1
kotte	....	....	....	....	....	....	4	....	....	4
lexington	....	....	....	....	....	....	1	....	....	1
meleagridis	....	....	....	....	....	1	....	....	....	1
muenchen	4	4	....	....	....	....	....	....	....	4
muenster	....	....	....	....	....	....	2	....	....	2
nchanga	....	....	....	....	....	....	1	....	....	1
new-brunswick	1	1	....	....	....	....	....	....	....	1
newington	1	3	....	....	....	....	....	....	7	10
newport	....	....	....	....	....	....	4	....	....	4
oranienburg	1	1	....	....	....	1	1	....	....	3
orion	2	2	....	....	....	1	....	....	1	4
paratyphi—B	1	2	....	....	....	....	31	....	1	34
perth	....	....	....	....	....	....	22	....	....	22
pullorum	....	....	....	....	....	116	....	....	....	116
reading	....	....	....	....	....	1	....	....	....	1
san-diego	....	....	....	....	....	....	1	....	....	1

SALMONELLA SEROTYPES ISOLATED FROM VARIOUS SOURCES—*continued*

Serotype	Human			Foods				Animals Reptiles, Birds, Fish, etc. (Other than Human Food)	Mis-cellaneous	Total Isolations
	Cases	Faeces	Miscel-laneous	Meat	Fish	Egg	Veget-able			
Year 1961—continued										
senftenburg	3	3	....	....	....	....	100	....	....	103
solna	....	....	....	....	....	....	3	....	....	3
tennessee	....	....	....	....	....	....	1	....	....	1
typhi	7	11	2	....	....	....	....	....	7	20
typhimurium	18	21	....	....	....	29	11	5	....	66
urbana	1	1	....	....	....	....	....	....	....	1
waycross	....	....	....	....	....	....	6	....	....	6
weltevreden	....	....	....	....	....	....	6	....	....	6
Total Isolations	....	67	10	....	....	175	270	10	16	548
Total Cases	55	....	....	....	....	....	....	....	....	....
Year 1962										
adelaide	3	4	....	....	....	2	....	1	....	7
alsterdorf	....	....	....	....	....	....	....	....	1	1
anatum	4	4	....	....	....	4	....	1	....	9
ball	1	1	....	....	....	....	....	....	....	1
blukwa	....	....	....	....	....	....	....	....	1	1
bovis-morbificans	2	2	....	....	....	34	....	....	....	36
bredeney	1	1	....	....	....	....	....	....	....	1
charity	2	2	....	....	....	....	....	....	....	2
chester	3	3	1	....	....	....	....	....	....	4
cholerae-suis	1	....	1	....	....	....	....	1	....	2
cubana	....	....	....	....	....	....	1	....	....	1
derby	....	....	....	....	....	22	....	....	....	22
eastbourne	2	4	....	....	....	....	....	....	....	4
ferlac	....	....	....	....	....	....	6	....	....	6
give	1	....	1	....	....	....	....	1	....	2
hvittingfoss	2	3	....	....	....	....	....	....	....	3
lindern	1	1	....	....	....	....	....	....	....	1
litchfield	....	....	....	....	....	....	1	....	....	1
muenchen	9	13	....	....	....	....	....	....	....	13
newington	3	3	....	....	....	....	....	1	....	4
newport	1	1	....	....	....	....	....	....	....	1
onderstepoort	1	1	....	....	....	....	....	....	....	1
oranienburg	....	....	....	....	....	14	....	....	....	14
orientalis....	1	1	....	....	....	....	....	....	....	1
orion	4	4	....	....	....	....	....	....	....	4
paratyphi—B	....	....	....	....	....	....	1	....	....	1
pullorum	....	....	....	....	....	70	....	....	....	70
saint-paul	2	2	....	....	....	....	....	....	....	2
senftenburg	3	7	....	....	....	....	1	....	....	8
treforest	1	1	....	....	....	....	....	....	....	1
typhi	5	4	3	....	....	....	....	....	....	7
typhimurium	44	76	....	....	....	68	1	3	1	149
urbana	4	4	....	....	....	....	....	....	....	4
wandsbek	....	....	....	....	....	....	....	....	2	2
wandsworth	7	7	....	....	....	....	....	....	....	7
Total Isolations	....	149	6	....	....	214	11	8	5	393
Total Cases	108	....	....	....	....	....	....	....	....	....
Year 1963										
adelaide	....	....	....	6	....	....	....	2	....	8
anatum	4	4	....	....	....	4	....	5	....	13
blukwa	1	1	....	....	....	....	....	....	....	1
bovis-morbificans	2	4	....	....	....	....	....	....	....	4
brisbane	1	3	....	....	....	....	....	....	....	3
champagne	1	1	....	....	....	....	....	....	....	1
chester	2	2	....	4	....	....	....	1	....	7
cholerae-suis	....	....	....	....	....	....	....	1	....	1
derby	....	....	....	....	....	42	....	....	....	42
emmastad	1	1	....	....	....	....	....	....	....	1
enteritidis	2	3	....	1	....	....	....	....	....	4
fremantle	1	1	....	....	....	....	....	....	....	1
give	....	....	....	....	....	2	....	4	....	6

SALMONELLA SEROTYPES ISOLATED FROM VARIOUS SOURCES—*continued*

Serotype	Human			Foods				Animals, Reptiles, Birds, Fish, etc. (Other Than Human Food)	Miscellaneous	Total Isolations
	Cases	Faeces	Miscellaneous	Meat	Fish	Egg	Vegetable			
Year 1963—continued										
heilbron	1	5	....	....	....	....	....	....	....	5
hvittingfoss	1	2	....	....	....	....	....	5	....	7
jangwani	2	2	....	....	....	....	....	....	....	2
muenchen	9	9	....	3	....	....	....	10	....	22
newington	1	1	....	....	....	....	....	3	....	4
newport	1	1	....	....	....	....	....	....	....	1
onderstepoort	2	3	....	....	....	....	....	....	....	3
oranienburg	2	2	....	....	....	3	....	3	....	8
orientalis	4	10	....	....	....	....	....	....	....	10
orion	1	1	....	4	....	....	....	....	....	5
paratyphi—A	2	2	1	....	....	....	....	....	....	3
paratyphi—B	4	4	....	....	....	....	....	....	....	4
poona	2	3	....	....	....	....	....	....	....	3
potsdam	1	1	....	1	....	....	....	....	....	2
pullorum	....	....	....	....	....	23	....	....	....	23
senftenburg	6	10	....	....	....	....	....	4	....	14
tennessee	1	1	....	....	....	....	....	....	....	1
typhi	7	13	5	....	....	....	....	....	....	18
typhimurium	52	67	....	2	....	12	....	10	....	91
wandsworth	4	6	....	....	....	....	....	....	....	6
Total Isolations	....	163	6	21	....	86	....	48	....	324
Total Cases	118	....	....	....	....	....	....	....	....	....
Year 1964										
abony	1	1	....	....	....	....	....	....	....	1
adelaide	7	12	....	....	....	....	....	....	4	16
anatum	1	1	....	....	1	....	....	....	1	3
bovis-morbificans	2	2	....	....	....	....	....	2	....	4
bredeney	1	1	....	....	....	....	....	....	....	1
brisbane	1	1	....	....	....	....	....	....	....	1
chester	5	8	1	....	....	....	....	4	....	13
cholerae-suis	....	....	....	....	....	....	....	10	....	10
derby	....	....	....	....	1	....	....	....	....	1
emmastad	2	2	....	....	....	....	....	....	....	2
give	2	2	....	....	....	....	....	....	....	2
hvittingfoss	2	3	....	....	1	....	....	....	....	4
kimberley	2	2	....	....	....	....	....	....	....	2
lexington	1	1	....	....	....	....	....	....	....	1
litchfield	2	3	....	....	....	....	....	....	....	3
muenchen	13	28	....	1	1	....	....	....	2	32
newington	2	2	....	....	....	....	....	....	....	2
onderstepoort	5	5	....	....	....	....	....	....	....	5
oranienburg	4	4	....	....	....	....	....	....	....	4
orion	3	4	....	....	....	....	....	....	....	4
paratyphi—B	1	1	....	....	....	....	....	....	....	1
poona	....	....	....	....	....	....	....	....	1	1
potsdam	1	1	....	....	....	....	....	....	....	1
saint-paul	5	8	....	....	....	....	....	....	....	8
senftenburg	1	1	....	....	....	....	....	....	1	2
tennessee	9	10	....	....	....	....	....	....	....	10
typhi	1	....	2	....	....	....	....	....	....	2
typhimurium	59	61	....	....	....	....	....	8	1	70
urbana	1	1	....	....	....	....	....	....	....	1
wandsbek	4	5	....	....	....	....	....	....	....	5
wandsworth	5	5	....	....	....	....	....	....	....	5
welikade	3	3	....	....	....	....	....	....	2	5
zehlendorf	1	1	....	....	....	....	....	....	....	1
Total Isolations	....	179	3	1	4	....	....	24	12	223
Total Cases	137	....	....	....	....	....	....	....	....	....

SALMONELLA SEROTYPES ISOLATED FROM VARIOUS SOURCES—*continued*

Serotype	Human			Foods				Animals Reptiles, Birds, Fish, etc. (Other than Human Food)	Mis-cellaneous	Total Isolations
	Cases	Faeces	Miscel-laneous	Meat	Fish	Egg	Veget-able			
Year 1965										
abony	4	4	....	....	....	....	....	....	....	4
adelaide	8	10	....	7	....	....	..	....	1	18
alsterdorf	1	1	....	....	....	....	....	....	....	1
anatum	4	4	....	7	....	....	....	....	....	11
birkenhead	....	....	....	....	....	....	....	1	....	1
bleadon	1	1	....	....	....	....	....	....	....	1
bovis-morbificans	....	....	....	....	....	....	....	5	1	6
california	1	1	....	....	....	....	....	....	....	1
chester	4	8	....	18	....	....	....	2	....	28
cholerae-suis	2	2	....	....	....	....	....	7	....	9
derby	2	2	....	....	....	....	....	....	....	2
eastbourne	4	7	....	....	....	....	....	....	....	7
emmastad	1	1	....	....	....	....	....	....	....	1
enteritidis	....	....	....	2	....	....	....	....	....	2
give	3	3	....	....	....	....	....	....	....	3
heidelburg	1	1	....	....	....	....	....	....	....	1
hvittingfoss	7	9	....	....	....	....	....	....	....	9
jangwani	5	7	....	....	....	....	....	....	....	7
litchfield	3	9	....	....	....	....	....	....	....	9
muenchen	21	30	....	5	....	....	....	....	....	35
new-brunswick	1	1	....	....	....	....	....	....	....	1
newington	2	2	....	....	....	....	....	....	....	2
ohlstedt	2	3	....	....	....	....	....	....	....	3
onderstepoort	1	3	....	....	....	....	....	....	....	3
oranienburg	7	7	....	5	....	....	....	....	....	12
orientalis	....	....	....	....	....	....	....	....	1	1
orion	3	3	....	5	....	....	....	....	....	8
paratyphi—B	2	2	....	....	....	....	...	....	....	2
poona	1	1	....	....	....	....	....	....	....	1
pullorum	....	....	....	....	....	4	....	12	....	16
saint-paul	2	2	....	....	....	....	....	....	....	2
san-diego	5	5	....	....	....	....	....	....	....	5
senftenburg	2	3	....	....	....	....	....	....	....	3
singapore	....	....	....	....	....	....	....	....	1	1
tennessee	3	3	....	....	....	....	....	....	....	3
typhi	2	....	2	....	....	....	....	..	....	2
typhimurium	37	59	....	....	....	1	....	18	1	79
urbana	1	1	....	....	....	....	....	....	....	1
wandsbek	10	12	....	....	....	....	....	...	....	12
Total Isolations	....	207	2	49	....	5	....	45	5	313
Total Cases	153	....	....	....	....	....	....	....	....	....
Year 1966										
abony	9	18	....	....	....	....	....	....	....	18
adelaide	9	19	....	10	....	....	....	1	1	31
anatum	7	10	....	1	....	....	....	5	1	17
bahrenfeld	10	15	....	....	....	....	....	....	....	15
ball	1	1	....	....	....	....	....	....	....	1
birkenhead	2	5	....	....	....	....	....	....	....	5
bredeney	7	11	....	....	....	....	....	....	....	11
brisbane	3	4	....	....	....	....	....	....	....	4
butantan	1	1	....	....	....	....	....	....	....	1
chester	27	47	....	9	....	....	....	2	2	60
derby	....	....	....	....	....	..	....	....	1	1
eastborne	2	2	....	....	....	....	....	....	....	2
enteritidis	3	3	....	2	....	....	....	....	....	5
give	2	2	....	....	....	....	....	1	....	3
hauten	....	...	....	1	....	....	....	....	....	1
havana	1	1	....	10	....	....	....	....	....	11
hilversum	....	..	....	....	1	....	....	....	....	1
hvittingfoss	4	10	....	....	....	....	....	....	....	10
infantis	1	1	....	....	...	....	....	....	....	1
inpraw	....	....	....	....	3	....	....	....	..	3
jangwani	6	16	....	....	..	....	..	....	..	16
kisarawe	....	....	....	....	....	....	..	6		6
kottbus	2	2	....	....	....	....	..	....		2
lansing	1	1	....	....	....	....	..	....	..	1
litchfield	3	3	..	..	....	....	..	....	....	3
mowanjum	....	....	....	....	....	....	....	1	....	1

SALMONELLA SEROTYPES ISOLATED FROM VARIOUS SOURCES—*continued*

Serotype	Human			Foods				Animals Reptiles, Birds, Fish, etc. (Other than Human Food)	Mis-cellaneous	Total Isolations
	Cases	Faeces	Miscel-laneous	Meat	Fish	Egg	Veget-able			
				Year 1966—continued						
muenchen	21	35	....	21	....	....	....	1	1	58
newington	1	1	....	....	....	....	....	....	....	1
newport	1	1	....	....	6	....	....	....	1	8
ohlstedt	1	3	....	....	....	....	....	....	....	3
oranienburg	9	17	....	1	....	....	....	1	3	22
orion	9	15	....	....	....	....	....	2	....	17
poona	3	3	....	....	....	....	....	....	....	3
pullorum	....	....	....	....	....	....	....	13	....	13
ramat-gan	....	....	....	....	1	....	....	....	....	1
rubislaw	3	5	....	....	....	....	....	1	....	6
saint-paul	1	1	....	....	....	....	....	....	....	1
san-diego	2	2	....	....	....	....	....	....	....	2
senftenburg	13	22	....	2	....	....	....	5	....	29
singapore	....	....	....	13	....	....	....	....	....	13
tennessee	6	16	....	....	....	....	....	1	....	17
typhimurium	71	119	....	13	....	....	....	14	....	146
typhi	2	7	....	....	....	....	....	....	....	7
urbana	1	1	....	....	....	....	....	....	....	1
wandsworth	1	1	....	....	....	....	....	1	....	2
welikade	1	1	....	....	....	....	....	....	....	1
weltevreden	....	....	....	....	1	....	....	....	....	1
O Group 47	....	....	....	....	....	....	....	3	....	3
Total Isolations	....	422	....	83	12	....	....	58	10	585
Total Cases	247	....	....	....	....	....	....	....	....	....

Salmonella Diagnostic and Reference Laboratory

PUBLIC HEALTH LABORATORY SERVICE

PERTH – WESTERN AUSTRALIA

Isolations of Salmonella and Arizona - 1967

CUMULATIVE INDEX

abony	1964, 1965, 1966, 1967
adelaide	1955, 1956, 1958, 1959, 1960, 1961, 1962, 1963, 1964, 1965, 1966, 1967
agodi	1958
alsterdorf	1962, 1965, 1967
amager	1958
amersfoort	1967
anatum	1955, 1956, 1957, 1958, 1959, 1960, 1961, 1962, 1963, 1964, 1965, 1966, 1967
angoda	1961
bahrenfeld	1966, 1967
ball	1961, 1962, 1966, 1967
bareilly	1958, 1960, 1961, 1967
berta	1957
birkenhead	1957, 1958, 1960, 1965, 1966, 1967
bleadon	1965
blukwa	1962, 1963, 1967
boecker	1967
bovis-morbificans	1955, 1956, 1958, 1959, 1960, 1961, 1962, 1963, 1964, 1965, 1966, 1967
braenderup	1958, 1961
bredeney	1958, 1962, 1964, 1966, 1967
brisbane	1963, 1964, 1966, 1967
bukavu	1967
bullbay	1967
butantan	1957, 1960, 1966
california	1965
cambridge	1957, 1958
champaign	1963, 1967
charity	1960, 1962, 1967
chester	1958, 1959, 1960, 1961, 1962, 1963, 1964, 1965, 1966, 1967
chingola	1961
chittagong	1961
cholerae-suis	1955, 1958, 1960, 1961, 1962, 1963, 1964, 1965, 1967
cubana	1958, 1962, 1967
dahlem	1960
decatur	1961
derby	1956, 1957, 1958, 1959, 1960, 1961, 1962, 1963, 1964, 1965, 1966, 1967
dublin	1967
eastbourne	1958, 1962, 1965, 1966, 1967
edinburgh	1957
eimsbuettel	1967
emmastad	1958, 1963, 1964, 1965, 1967
enteritidis	1961, 1963, 1965, 1966, 1967
ferlac	1960, 1961, 1962
fremantle	1958, 1959, 1963, 1967
give	1957, 1958, 1959, 1962, 1963, 1964, 1965, 1966, 1967
havana	1966, 1967
heidelburg	1965
halmstad	1958
heilbron	1963
hilversum	1966
houten	1967
hvittingfoss	1960, 1961, 1962, 1963, 1964, 1965, 1966, 1967
infantis	1966
inpraw	1966
jangwani	1958, 1963, 1965, 1966, 1967
kaapstad	1958
kentucky	1958
kibusi	1967
kimberley	1964, 1967
kisarwe	1966, 1967
kotte	1960, 1961
kottbus	1966
lansing	1966, 1967
lexington	1958, 1961, 1964
lindern	1962, 1967
litchfield	1962, 1964, 1965, 1966, 1967
meleagridis	1958, 1959, 1960, 1961
montevideo	1957
mowanjum	1966
muenchen	1957, 1958, 1959, 1960, 1961, 1962, 1963, 1964, 1965, 1966, 1967
muenster	1958, 1959, 1961
nashua	1967
nchnanga	1960, 1961
new-brunswick	1956, 1958, 1961, 1965, 1967
newington	1958, 1960, 1961, 1962, 1963, 1964, 1965, 1966, 1967
newport	1957, 1958, 1960, 1961, 1962, 1963, 1964, 1966, 1967
nyborg	1957, 1958

CUMULATIVE INDEX - continued

ohlstedt	1965, 1966, 1967
onderstepoort	1959, 1960, 1962, 1963, 1964, 1965, 1967
orienienburg	1957, 1958, 1959, 1960, 1961, 1962, 1963, 1964, 1965, 1966, 1967
orientalis	1959, 1960, 1962, 1963, 1965, 1967
orion	1956, 1958, 1959, 1961, 1962, 1963, 1964, 1965, 1966, 1967
paratyphi—A	1955, 1956, 1963
paratyphi—B	1956, 1957, 1958, 1960, 1961, 1962, 1963, 1964, 1965
perth	1957, 1961
poona	1956, 1963, 1964, 1965, 1966, 1967
potsdam	1958, 1960, 1963, 1964, 1967
pullorum	1957, 1958, 1959, 1960, 1961, 1962, 1963, 1965, 1966, 1967
ramat-gan	1966, 1967
reading	1958, 1960, 1961
rubislaw	1960, 1966, 1967
saarbruecken	1958
saint-paul	1958, 1962, 1964, 1965, 1966, 1967
san-diego	1957, 1958, 1961, 1965, 1966
selandia	1958
senftenburg	1958, 1959, 1960, 1961, 1962, 1963, 1964, 1965, 1966, 1967
singapore	1965, 1966, 1967
solna	1961
taksony	1958
tennessee	1961, 1963, 1964, 1965, 1966, 1967
thompson	1960
treforest	1967
typhi	1955, 1956, 1957, 1958, 1959, 1960, 1961, 1962, 1963, 1964, 1965, 1966, 1967
typhimurium	1955, 1956, 1957, 1958, 1959, 1960, 1961, 1962, 1963, 1964, 1965, 1966, 1967
urbana	1961, 1962, 1964, 1965, 1966, 1967
uzaramo	1967
vejle	1958
wandsbek	1962, 1964, 1965, 1967
wandsworth	1962, 1963, 1964, 1966, 1967
waycross	1960, 1961, 1967
welikade	1964, 1966, 1967
weltevreden	1961, 1966, 1967
worthington	1957, 1958, 1959
zehlendorf	1964
Salmonella 38, lv : 1,6	1967
Salmonella 42.z :—	1967
Salmonella 44.z4,z23	1967
Salmonella 47.k :—	1967
Salmonella 48, eh : 1,5	1967
Salmonella group	1967
Arizona spp.	17 isolated

SALMONELLA SEROTYPES ISOLATED FROM VARIOUS SOURCES—1967

Serotype	Human			Foods			Animals, Reptiles, Birds, Fish, etc. (Other Than Human Food)	Miscellaneous	Total Isolations
	Cases	Faeces	Miscellaneous	Meat	Fish	Egg			
abony	6	10	....	....	....	....	4	....	14
adelaide	21	33	....	8	....	....	44	12	97
alsterdorf	....	....	....	....	....	....	4	....	4
amersfoort	....	....	....	1	....	....	....	....	1
anatum	11	11	....	1	....	....	4	13	29
bahrenfeld	....	....	....	1	....	....	1	....	2
ball	1	1	....	....	....	....	....	....	1
bareilly	1	1	....	....	....	....	....	1	2
birkenhead	....	....	....	....	....	....	1	....	1
blukwa	....	....	....	....	....	....	....	1	1
boecker	....	....	....	....	....	....	1	....	1
bovis-morbificans	7	17	....	1	....	....	5	7	30
bredeney	2	2	....	....	....	....	....	....	2
brisbane	2	3	....	....	....	....	....	....	3
bukavu	1	3	....	....	....	....	....	....	3
bullbay	....	....	....	....	....	....	4	....	4
champaign	....	....	....	....	....	....	6	....	6
charity	....	....	....	....	....	....	1	....	1
chester	21	31	....	4	....	10	60	21	126
cholerae-suis	1	1	....	....	....	....	14	....	15
cubana	....	....	....	....	....	....	....	3	3
derby	3	4	....	....	....	3	30	12	49
dublin	1	....	1	....	....	....	....	....	1
eastbourne	1	2	....	....	....	....	....	....	2
eimsbuettel	....	....	....	....	....	....	1	....	1
emmastad	3	3	....	....	....	....	1	....	4
enteritidis	3	6	....	....	....	....	3	4	13
fremantle	1	1	....	....	....	....	2	....	3
give	7	8	....	5	....	....	13	4	30
houten	....	....	....	....	....	....	1	....	1
havana	3	8	....	....	....	....	....	....	8
hvittingfoss	4	5	....	....	....	....	4	1	10
jangwani	4	5	....	....	....	....	....	....	5
kibusi	....	....	....	....	....	....	3	....	3
kimberley	4	5	....	....	....	....	....	....	5
kisarawe	....	....	....	....	....	....	4	....	4
lansing	4	4	....	....	....	....	....	....	4
lindern	....	....	....	....	....	....	2	....	2
litchfield	3	4	....	....	....	....	....	....	4
muenchen	36	85	....	10	....	2	26	7	130
nashua	....	....	....	....	....	....	5	....	5
new-brunswick	....	....	....	....	....	....	2	....	2
newington	4	11	....	1	....	....	4	8	24
newport	....	....	....	....	....	....	1	....	1
ohlstedt	1	1	....	....	....	....	3	1	5
onderstepoort	9	9	....	2	....	....	6	....	17
oranienburg	13	18	....	....	....	6	....	3	27
orientalis	....	....	....	....	....	....	4	2	6
orion	10	13	....	3	....	....	8	4	28
poona	1	2	....	....	....	....	....	....	2
potsdam	1	2	....	1	....	....	....	....	3
pullorum	....	....	....	....	....	2	....	....	2
ramat-gan	2	2	....	....	....	....	....	....	2
rubislaw	8	14	....	....	....	....	2	1	17
saint-paul	5	7	....	....	....	....	18	7	32
senftenburg	8	19	....	....	....	....	2	1	22
singapore	3	4	....	....	....	....	....	....	4
tennessee	6	6	....	....	....	....	1	9	16
treforest	2	2	....	....	....	....	....	....	2
typhi	2	2	....	....	....	....	....	....	2
typhimurium	151	321	....	34	1	....	37	64	457
urbana	....	....	....	....	....	....	1	....	1
uzaramo	....	....	....	....	....	....	....	1	1
wandsbek	....	....	....	....	....	....	4	5	9
wandsworth	10	12	....	....	....	....	....	....	12
waycross	....	....	....	1	....	....	....	1	2
welikade	1	1	....	....	....	....	....	....	1
weltevreden	....	....	....	....	....	....	....	8	8
Salmonella 42 : z :—	....	....	....	....	....	....	1	....	1
Salmonella 38 : lv : 1,6	....	....	....	....	....	....	....	1	1
Salmonella 44.z4,z23	....	....	....	....	....	....	....	1	1
Salmonella 47 : k :—	1	1	....	....	....	....	....	....	1
Salmonella 48.eh : 1.5.	2	3	....	....	....	....	....	....	3
Salmonella group	1	1	....	....	....	....	2	3	6
Arizona 1,33 : 23-21	....	....	....	....	....	....	4	....	4
Arizona 5 : 29-21	....	....	....	....	....	....	7	2	9

SALMONELLA SEROTYPES ISOLATED FROM VARIOUS SOURCES—*continued*

Serotype	Human			Foods			Animals, Reptiles, Birds, Fish, etc. (Other Than Human Food)	Miscellaneous	Total Isolations
	Cases	Faeces	Miscellaneous	Meat	Fish	Egg			
Arizona 5 : 29–30....	1	2	....	....	....	....	2	....	4
Arizona 15 : 24–31....	....	....	....	....	....	....	1	....	1
Arizona 16 : 23–25....	....	....	....	....	....	....	6	1	7
Arizona 16 : 23–37....	....	....	....	....	....	....	1	1	2
Arizona 16 : 27–25....	....	....	....	....	....	....	12	1	13
Arizona 26 : 23–21....	....	....	....	....	....	....	1	....	1
Arizona 26 : 24–25....	....	....	....	....	....	....	1	....	1
Arizona 26 : 26–25....	4	4	....	....	....	....	....	....	4
Arizona 26 : 33–	....	....	....	....	....	....	....	1	1
Arizona 26 : 33–31....	....	....	....	....	....	....	4	1	5
Arizona 28 : 23–25....	....	....	....	....	....	....	1	....	1
Arizona 28 : 32–28....	....	....	....	....	....	....	1	....	1
Arizona 29 : 24–31....	....	....	....	....	....	....	1	....	1
Arizona 29 : 29–25....	....	....	....	....	....	....	2	....	2
Arizona group	1	2	....	....	....	....	9	3	14
Total Isolations	....	712	1	73	1	23	393	216	1,419
Total Cases	398	....	....	....	....	....	....	....	....

Appendix II

Tuberculosis Control Branch

Annual Report for the Year Ended 31st December, 1966

New notifications of pulmonary disease for 1966, as compared with figures for the years back to 1961, show a decrease in incidence from 24.7 (1961) to 12.2 (1966) per 100,000 of population. The decline has been fairly uniform, although in 1962 there was a slight rise to 27.0.

Notifications of non-pulmonary disease have remained numerically fairly steady over the period, that is, the incidence of this type of case has fallen slightly along with population increase. Forty new cases were notified in 1961 and 32 in 1966.

The total overall incidence (that is including re-notifications and non-pulmonary disease) fell from 32.3 to 19.3 over the period.

NOTIFICATIONS TO THE TUBERCULOSIS REGISTER

Persons with disease due to atypical mycobacteria are entered on the Tuberculosis Register for statistical and other reasons mainly associated with problems of diagnosis.

Notifications received during the year have been classified according to the organisms producing disease and form of disease as follows :

Form	M.T.B. (human type)	Proven Atypical Mycobacteria Runyon Group			Bovine
		I	II	III	
Pulmonary (adult type)	118	2	3	7	1
Pleurisy with effusion	3	....	....	....	....
Non-Pulmonary :					
Glands	7	....	2	6	....
Genitourinary	12	....	....	....	1
Bone and Joint	5	....	....	....	....
Abdominal	2	....	....	....	....
Chest Wall	1	....	....	....	....

Nine of the above patients were transfers in from other States. Included also are 27 re-notifications (one in the atypical group).

AGE GROUPS INVOLVED

Figures two and three show rates in the various age groups for both sexes in 1961 and 1966. The reduction in the female rate has been quite marked, rates for the intervening years falling largely in the space between the two tracings. There is a suggestion that as time goes on the graph for adult females will take up a more or less horizontal position a short distance above the abscissa. In males the characteristic rise from the age of 50 onwards to an apex at about 65 years is still in evidence.

The incidence in children is now very low ; such cases as do occur are in the main glandular infections with atypical mycobacteria. Table nine lists these cases for the years 1961 through to 1966 according to the organism identified. It is seen that M. Battey was the organism involved in most bacillary positive cases and it is reasonable to assume on this evidence and additional evidence provided by comparative skin testing, that the majority of bacillary negative cases of glandular disease were also infected by Battey bacilli.

SOURCE OF NOTIFICATIONS

Examination of notified cases according to source of the report back to 1961 shows a decreasing tendency for private medical practitioners to notify these without first using Chest Clinic facilities for establishing diagnosis, and also a gradual fall-off in the proportion of patients detected through the activity of mass surveys.

BACILLARY POSITIVE CASES

Seventy-one per cent. of new cases in 1966 were proven by isolation and identification of the mycobacteria concerned. Percentages for previous years were :

1961	52%
1962	60%
1963	75%
1964	77%
1965	75%

Salmonella Diagnostic and Reference Laboratory

PUBLIC HEALTH LABORATORY SERVICE

PERTH – WESTERN AUSTRALIA

Isolations of Salmonella, 1955-1966

(3)—43791

INDEX

abony 1964, 1965, 1966
adelaide 1955, 1956, 1958, 1959, 1960, 1961, 1962, 1963, 1964, 1965, 1966
agodi 1958
alsterdorf 1962, 1965
amager 1958
anatum 1955, 1956, 1957, 1958, 1959, 1960, 1961, 1962, 1963, 1964, 1965, 1966
angoda 1961

bahrenfeld 1966
ball 1961, 1962, 1966
bareilly 1958, 1960, 1961
berta 1957
birkenhead 1957, 1958, 1960, 1965, 1966
bleadon 1965
blukwa 1962, 1963
bovis-morbificans 1955, 1956, 1958, 1959, 1960, 1961, 1962, 1963, 1964, 1965, 1966
braenderup 1958, 1961
bredeney 1958, 1962, 1964, 1966
brisbane 1963, 1964, 1966
butantan 1957, 1960, 1966

california 1965
cambridge 1957, 1958
champagne 1963
charity 1960, 1962
chester 1958, 1959, 1960, 1961, 1962, 1963, 1964, 1965, 1966
chingola 1961
chittagong 1961
cholerae-suis 1955, 1958, 1960, 1961, 1962, 1963, 1964, 1965
cubana 1958, 1962

dahlem 1960
decatur 1961
derby 1956, 1957, 1958, 1959, 1960, 1961, 1962, 1963, 1964, 1965, 1966

eastbourne 1958, 1962, 1965, 1966
edinburgh 1957
emnastad 1958, 1963, 1964, 1965
enteritidis 1961, 1963, 1965, 1966

ferlac 1960, 1961, 1962
fremantle 1958, 1959, 1963

give 1957, 1958, 1959, 1962, 1963, 1964, 1965, 1966

havana 1966
heidelburg 1965
halmstad 1958
heilbron 1963
hilversum 1966
hvittingfoss 1960, 1961, 1962, 1963, 1964, 1965, 1966

infantis 1966
inpraw 1966
jangwani 1958, 1963, 1965, 1966

kaapstad 1958
kentucky 1958
kimberley 1964
kisarwe 1966
kotte 1960, 1961
kottbus 1966

lansing 1966
lexington 1958, 1961, 1964
lindern 1962
litchfield 1962, 1964, 1965, 1966

meleagridis 1958, 1959, 1960, 1961
montevideo 1957
mowanjum 1966
muenchen 1957, 1958, 1959, 1960, 1961, 1962, 1963, 1964, 1965, 1966
muenster 1958, 1959, 1961

nchanga 1960, 1961
new-brunswick 1956, 1958, 1961, 1965
newington 1958, 1960, 1961, 1962, 1963, 1964, 1965, 1966
newport 1957, 1958, 1960, 1961, 1962, 1963, 1966
nyborg 1957, 1958

ohlstedt 1965, 1966
onderstepoort 1959, 1960, 1962, 1963, 1964, 1965
oranienburg 1957, 1958, 1959, 1960, 1961, 1962, 1963, 1964, 1954, 1966
orientalis 1959, 1960, 1962, 1963, 1965
orion 1956, 1958, 1959, 1961, 1962, 1963, 1964, 1965, 1966

paratyphi—A 1955, 1956, 1963
paratyphi—B 1956, 1957, 1958, 1960, 1961, 1962, 1963, 1964, 1965
perth 1957, 1961
poona 1956, 1963, 1964, 1965, 1966
potsdam 1958, 1960, 1963, 1964
pullorum 1957, 1958, 1959, 1960, 1961, 1962, 1963, 1965, 1966

Index—continued

ramat-gan 1966
reading 1958, 1960, 1961
rubislaw 1960, 1966

saarbruecken 1958
saint-paul 1958, 1962, 1964, 1965, 1966
san-diego 1957, 1958, 1961, 1965, 1966
selandia 1958
senftenburg 1958, 1959, 1960, 1961, 1962, 1963, 1964, 1965, 1966
singapore 1965, 1966
solna 1961

taksony 1958
tennessee 1961, 1963, 1964, 1965, 1966
thompson 1960
typhi 1955, 1956, 1957, 1958, 1959, 1960, 1961, 1962, 1963, 1964, 1965, 1966
typhimurium 1955, 1956, 1957, 1958, 1959, 1960, 1961, 1962, 1963, 1964, 1965, 1966

urbana 1961, 1962, 1964, 1965, 1966

vejle 1958

wandsbek 1962, 1964, 1965
wandsworth 1962, 1963, 1964, 1966
waycross 1960, 1961
welikade 1964, 1966
weltevreden 1961, 1966
worthington 1957, 1958, 1959

zehlendorf 1964

SALMONELLA SEROTYPES ISOLATED FROM VARIOUS SOURCES

Serotype	Human			Foods				Animals, Reptiles, Birds, Fish, etc. (Other Than Human Food)	Miscellaneous	Total Isolations
	Cases	Faeces	Miscellaneous	Meat	Fish	Egg	Vegetable			
Year 1955										
adelaide	1	1	....	....	....	....	....	....	....	1
anatum	1	1	....	....	....	....	....	....	....	1
bovis-morbificans	1	1	....	....	....	....	....	....	....	1
cholerae-suis	1	....	1	....	....	....	....	....	....	1
paratyphi—A	2	1	3	....	....	....	....	....	....	4
typhi	6	4	4	....	....	....	....	....	....	8
typhimurium	2	2	....	....	....	....	....	....	....	2
Total Isolations	....	10	8	....	....	....	....	....	....	18
Total Cases	14	....	....	....	....	....	....	....	....	....
Year 1956										
adelaide	1	1	....	....	....	....	....	....	....	1
anatum	1	1	....	....	....	....	....	....	....	1
bovis-morbificans	2	2	....	....	....	....	....	....	....	2
derby	....	....	....	....	....	....	....	....	1	1
new-brunswick	....	....	....	....	....	1	....	....	....	1
orion	....	....	....	....	....	1	....	....	....	1
paratyphi—A	1	1	....	....	....	....	....	....	....	1
paratyphi—B	2	1	2	....	....	....	....	....	....	3
poona	....	....	....	....	....	1	....	....	....	1
typhi	5	10	2	....	....	....	....	....	....	12
typhimurium	2	2	....	....	....	....	....	....	1	3
Total Isolations	....	18	4	....	....	3	....	....	2	27
Total Cases	14	....	....	....	....	....	....	....	....	....
Year 1957										
anatum	....	....	....	....	....	1	....	....	....	1
berta	....	....	....	....	....	....	....	....	1	1
birkenhead	....	....	....	....	....	....	....	....	1	1
butantan	....	....	....	....	....	....	5	....	....	5
cambridge	....	....	....	....	....	....	....	....	3	3
derby	....	....	....	....	....	7	....	1	....	8
edinburgh	....	....	....	....	....	....	2	....	....	2
give	1	5	....	....	....	2	....	....	....	7
montevideo	....	....	....	....	....	1	....	....	....	1
muenchen	1	1	....	....	....	1	....	....	....	2
newport	3	3	....	....	....	1	....	....	....	4
nyborg	....	....	....	....	....	....	....	1	....	1
oranienburg	....	....	....	....	....	27	....	2	1	30
paratyphi—B	....	....	....	....	....	....	1	....	....	1
perth	....	....	....	....	....	....	3	....	....	3
pullorum	....	....	....	....	....	80	....	....	....	80
san-diego	....	....	....	....	....	....	....	1	....	1
typhi	4	5	1	....	....	....	....	....	....	6
typhimurium	3	6	....	....	....	11	....	....	5	22
worthington	....	....	....	....	....	1	....	....	....	1
Total Isolations	....	20	1	....	....	132	11	5	11	180
Total Cases	12	....	....	....	....	....	....	....	....	....
Year 1958										
adelaide	2	2	....	....	....	6	....	7	....	15
agodi	....	....	....	....	....	....	....	1	....	1
amager	....	....	....	....	....	....	....	2	....	2
anatum	....	....	....	....	....	1	....	26	1	28
bareilly	....	....	....	....	....	1	....	1	....	2
birkenhead	....	....	....	....	....	....	....	1	....	1
bovis-morbificans	3	9	....	....	....	....	....	5	2	16
braenderup	....	....	....	....	....	....	....	7	....	7
bredeney	....	....	....	....	....	....	....	6	....	6

SALMONELLA SEROTYPES ISOLATED FROM VARIOUS SOURCES—*continued*

Year 1958—continued

Serotype	Human			Foods				Animals Reptiles, Birds, Fish, etc. (Other than Human Food)	Miscellaneous	Total Isolations
	Cases	Faeces	Miscellaneous	Meat	Fish	Egg	Vegetable			
cambridge	....	....	....	....	....	....	....	4	....	4
chester	....	....	....	....	....	2	....	3	....	5
cholerae-suis	....	....	....	....	....	....	....	2	....	2
cubana	....	....	....	....	....	....	....	21	....	21
derby	....	....	....	....	....	4	....	15	....	19
eastbourne	1	1	....	....	....	....	....	....	....	1
emmastad	1	1	....	....	....	....	....	....	....	1
fremantle	1	1	....	....	....	....	....	....	....	1
give	....	....	....	....	....	2	....	22	1	25
halmstad	....	....	....	....	....	....	....	1	....	1
jangwani	....	....	....	....	....	....	....	1	....	1
kaapstad	....	....	....	....	....	....	....	....	1	1
kentucky	....	....	....	....	....	....	....	1	....	1
lexington	....	....	....	....	....	....	....	3	....	3
meleagridis	4	4	....	....	....	3	....	16	9	32
muenchen	....	....	....	....	....	....	....	1	....	1
muenster	....	....	....	....	....	1	....	....	....	1
new-brunswick	....	....	....	....	....	....	....	2	....	2
newington	....	....	....	....	....	....	....	2	....	2
newport	1	1	....	....	....	....	....	5	....	6
nyborg	....	....	....	....	....	5	....	3	1	9
oranienburg	....	....	....	....	....	8	....	6	....	14
orion	....	....	....	....	....	2	....	....	....	2
paratyphi—B	....	....	....	....	....	....	....	....	7	7
potsdam	....	....	....	....	....	1	....	....	....	1
pullorum	....	....	....	....	....	245	....	....	....	245
reading	....	....	....	....	....	1	....	....	....	1
saarbruecken	....	....	....	....	....	....	....	1	....	1
saint-paul	....	....	....	....	....	....	....	....	1	1
san-diego	....	....	....	....	....	....	....	3	....	3
selandia	....	....	....	....	....	....	....	1	....	1
senftenburg	....	....	....	....	....	3	....	14	2	19
taksony	....	....	....	....	....	....	....	7	....	7
typhi	19	41	14	....	....	....	....	....	21	76
typhimurium	1	6	....	....	....	110	....	40	10	166
vejle	....	....	....	....	....	1	....	1	....	2
worthington	....	....	....	....	....	1	....	23	....	24
Total Isolations	....	66	14	....	....	397	....	254	56	787
Total Cases	33	....	....	....	....	....	....	....	....	....

Year 1959

Serotype	Human			Foods				Animals Reptiles, Birds, Fish, etc. (Other than Human Food)	Miscellaneous	Total Isolations
	Cases	Faeces	Miscellaneous	Meat	Fish	Egg	Vegetable			
adelaide	....	....	....	....	....	3	....	....	....	3
anatum	2	2	....	....	....	5	....	....	1	8
bovis-morbificans	2	2	....	....	....	5	....	....	....	7
chester	1	1	....	....	....	....	....	....	....	1
derby	....	....	....	....	....	4	....	....	2	6
fremantle	....	....	....	....	....	1	....	....	....	1
give	....	....	....	....	....	....	....	....	1	1
meleagridis	....	....	....	....	....	1	....	....	....	1
muenchen	3	3	....	....	....	....	....	....	....	3
muenster	....	....	....	....	....	1	....	....	....	1
onderstepoort	....	....	....	....	....	....	....	....	1	1
oranienburg	....	....	....	....	....	12	....	....	....	12
orientalis	....	....	....	....	....	....	....	....	1	1
orion	....	....	....	....	....	4	....	....	....	4
pullorum	....	....	....	....	....	237	....	....	....	237
senftenburg	1	1	....	....	....	....	....	....	....	1
typhi	9	19	4	....	....	....	....	....	....	23
typhimurium	22	34	....	....	....	98	....	....	....	132
worthington	....	....	....	....	....	6	....	....	....	6
Total Isolations	....	62	4	....	....	377	....	....	6	449
Total Cases	40	....	....	....	....	....	....	....	....	....

SALMONELLA SEROTYPES ISOLATED FROM VARIOUS SOURCES—*cantinued*

Serotype	Human			Foods				Animals, Reptiles, Birds, Fish, etc. (Other Than Human Food)	Miscellaneous	Total Isolations
	Cases	Faeces	Miscellaneous	Meat	Fish	Egg	Vegetable			
Year 1960										
adelaide	1	1	....	2	....	5	....	....	....	8
anatum	....	....	....	....	....	3	....	....	....	3
bareilly	....	....	....	....	....	....	3	....	....	3
birkenhead	....	....	....	....	....	....	....	1	1	2
bovis-morbificans	4	4	....	....	....	2	....	....	....	6
butantan	....	....	....	....	....	....	1	....	....	1
charity	....	....	....	....	....	....	....	....	1	1
chester	1	8	....	....	....	....	....	....	....	8
cholerae-suis	2	....	8	....	....	....	....	....	....	8
dahlem	1	1	....	....	....	....	....	....	....	1
derby	2	2	....	....	....	....	....	1	....	3
ferlac	....	....	....	....	....	....	1	....	....	1
hvittingfoss	....	....	....	....	....	....	2	....	....	2
kotte	....	....	....	....	....	....	2	....	....	2
meleagridis	....	....	....	....	....	3	....	....	....	3
muenchen	2	2	....	....	....	....	....	....	....	2
nchanga	....	....	....	....	....	....	1	....	....	1
newington	1	1	....	....	....	....	....	....	....	1
newport	....	....	....	....	....	....	3	....	....	3
onderstepoort	....	....	....	....	....	....	....	2	....	2
oranienburg	....	....	....	....	....	12	....	....	....	12
orientalis	....	....	....	....	....	....	....	1	....	1
paratyphi—B	....	....	....	....	....	....	2	....	....	2
potsdam	1	1	....	1	....	....	....	....	....	2
pullorum	....	....	....	....	....	49	....	....	....	49
reading	1	1	....	....	....	....	....	....	....	1
rubislaw	1	1	....	....	....	....	1	....	....	2
senftenburg	1	1	....	....	....	1	....	....	....	2
thompson	....	....	....	....	....	....	3	....	....	3
typhi	3	8	....	....	....	....	....	....	....	8
typhimurium	24	38	....	....	....	7	2	....	....	47
waycross	....	....	....	....	....	....	7	....	....	7
Total Isolations	....	69	8	3	....	81	29	5	2	197
Total Cases	45	....	....	....	....	....	....	....	....	....
Year 1961										
adelaide	2	2	....	....	....	5	....	1	....	8
anatum	1	1	....	....	....	1	....	1	....	3
angoda	....	....	....	....	....	....	10	....	....	10
ball	2	2	....	....	....	....	....	....	....	2
bareilly	....	....	....	....	....	1	16	....	....	17
bovis-morbificans	1	1	....	....	....	9	....	....	....	10
braenberup	....	....	....	....	....	....	1	....	....	1
chester	4	4	....	....	....	2	1	1	....	8
chingola	....	....	....	....	....	....	4	....	....	4
chittagong	....	....	....	....	....	....	17	....	....	17
cholerae-suis	....	....	8	....	....	....	....	1	....	9
decatur	....	....	....	....	....	....	....	1	....	1
derby	5	7	....	....	....	8	....	....	....	15
enteritidis	1	1	....	....	....	....	....	....	....	1
ferlac	....	....	....	....	....	....	26	....	....	26
hvittingfoss	....	....	....	....	....	....	1	....	....	1
kotte	....	....	....	....	....	....	4	....	....	4
lexington	....	....	....	....	....	....	1	....	....	1
meleagridis	....	....	....	....	....	1	....	....	....	1
muenchen	4	4	....	....	....	....	....	....	....	4
muenster	....	....	....	....	....	....	2	....	....	2
nchanga	....	....	....	....	....	....	1	....	....	1
new-brunswick	1	1	....	....	....	....	....	....	....	1
newington	1	3	....	....	....	....	....	....	7	10
newport	....	....	....	....	....	....	4	....	....	4
oranienburg	1	1	....	....	....	1	1	....	....	3
orion	2	2	....	....	....	1	....	....	1	4
paratyphi—B	1	2	....	....	....	....	31	....	1	34
perth	....	....	....	....	....	....	22	....	....	22
pullorum	....	....	....	....	....	116	....	....	....	116
reading	....	....	....	....	....	1	....	....	....	1
san-diego	....	....	....	....	....	....	1	....	....	1

SALMONELLA SEROTYPES ISOLATED FROM VARIOUS SOURCES—*continued*

Serotype	Human			Foods				Animals Reptiles, Birds, Fish, etc. (Other than Human Food)	Miscellaneous	Total Isolations
	Cases	Faeces	Miscellaneous	Meat	Fish	Egg	Vegetable			
Year 1961—continued										
senftenburg	3	3	....	....	....	....	100	....	....	103
solna	....	....	....	....	....	....	3	....	....	3
tennessee	....	....	....	....	....	....	1	....	....	1
typhi	7	11	2	....	....	....	....	....	7	20
typhimurium	18	21	....	....	....	29	11	5	....	66
urbana	1	1	....	....	....	....	....	....	....	1
waycross	....	....	....	....	....	....	6	....	....	6
weltevreden	....	....	....	....	....	....	6	....	....	6
Total Isolations	....	67	10	....	....	175	270	10	16	548
Total Cases	55	....	....	....	....	....	....	....	....	....
Year 1962										
adelaide	3	4	....	....	....	2	....	1	....	7
alsterdorf	....	....	....	....	....	....	....	....	1	1
anatum	4	4	....	....	....	4	....	1	....	9
ball	1	1	....	....	....	....	....	....	....	1
blukwa	....	....	....	....	....	....	....	....	1	1
bovis-morbificans	2	2	....	....	....	34	....	....	....	36
bredeney	1	1	....	....	....	....	....	....	....	1
charity	2	2	....	....	....	....	....	....	....	2
chester	3	3	1	....	....	....	....	....	....	4
cholerae-suis	1	....	1	....	....	....	....	1	....	2
cubana	....	....	....	....	....	....	1	....	....	1
derby	....	....	....	....	....	22	....	....	....	22
eastbourne	2	4	....	....	....	....	....	....	....	4
ferlac	....	....	....	....	....	....	6	....	....	6
give	1	....	1	....	....	....	....	1	....	2
hvittingfoss	2	3	....	....	....	....	....	....	....	3
lindern	1	1	....	....	....	....	....	....	....	1
litchfield	....	....	....	....	....	....	1	....	....	1
muenchen	9	13	....	....	....	....	....	....	....	13
newington	3	3	....	....	....	....	....	1	....	4
newport	1	1	....	....	....	....	....	....	....	1
onderstepoort	1	1	....	....	....	....	....	....	....	1
oranienburg	....	....	....	....	....	14	....	....	....	14
orientalis....	1	1	....	....	....	....	....	....	....	1
orion	4	4	....	....	....	....	....	....	....	4
paratyphi—B	....	....	....	....	....	....	1	....	....	1
pullorum	....	....	....	....	....	70	....	....	....	70
saint-paul	2	2	....	....	....	....	....	....	....	2
senftenburg	3	7	....	....	....	....	1	....	....	8
treforest	1	1	....	....	....	....	....	....	....	1
typhi	5	4	3	....	....	....	....	....	....	7
typhimurium	44	76	....	....	....	68	1	3	1	149
urbana	4	4	....	....	....	....	....	....	....	4
wandsbek	....	....	....	....	....	....	....	....	2	2
wandsworth	7	7	....	....	....	....	....	....	....	7
Total Isolations	....	149	6	....	....	214	11	8	5	393
Total Cases	108	....	....	....	....	....	....	....	....	....
Year 1963										
adelaide	....	....	....	6	....	....	....	2	....	8
anatum	4	4	....	....	....	4	....	5	....	13
blukwa	1	1	....	....	....	....	....	....	....	1
bovis-morbificans	2	4	....	....	....	....	....	....	....	4
brisbane	1	3	....	....	....	....	....	....	....	3
champagne	1	1	....	....	....	....	....	....	....	1
chester	2	2	....	4	....	....	....	1	....	7
cholerae-suis	....	....	....	....	....	....	....	1	....	1
derby	....	....	....	....	....	42	....	....	....	42
emmastad	1	1	....	....	....	....	....	....	....	1
enteritidis	2	3	....	1	....	....	....	....	....	4
fremantle	1	1	....	....	....	....	....	....	....	1
give	....	....	....	....	....	2	....	4	....	6

SALMONELLA SEROTYPES ISOLATED FROM VARIOUS SOURCES—*continued*

Serotype	Human			Foods				Animals, Reptiles, Birds, Fish, etc. (Other Than Human Food)	Miscellaneous	Total Isolations
	Cases	Faeces	Miscellaneous	Meat	Fish	Egg	Vegetable			
Year 1963—continued										
heilbron	1	5	....	....	....	....	....	....	....	5
hvittingfoss	1	2	....	....	....	....	....	5	....	7
jangwani	2	2	....	....	....	....	....	....	....	2
muenchen	9	9	....	3	....	....	....	10	....	22
newington	1	1	....	....	....	....	....	3	....	4
newport	1	1	....	....	....	....	....	....	....	1
onderstepoort	2	3	....	....	....	....	....	....	....	3
oranienburg	2	2	....	....	....	3	....	3	....	8
orientalis	4	10	....	....	....	....	....	....	....	10
orion	1	1	....	4	....	....	....	....	....	5
paratyphi—A	2	2	1	....	....	....	....	....	....	3
paratyphi—B	4	4	....	....	....	....	....	....	....	4
poona	2	3	....	....	....	....	....	....	....	3
potsdam	1	1	....	1	....	....	....	....	....	2
pullorum	....	....	....	....	....	23	....	....	....	23
senftenburg	6	10	....	....	....	....	....	4	....	14
tennessee	1	1	....	....	....	....	....	....	....	1
typhi	7	13	5	....	....	....	....	....	....	18
typhimurium	52	67	....	2	....	12	....	10	....	91
wandsworth	4	6	....	....	....	....	....	....	....	6
Total Isolations	....	163	6	21	....	86	....	48	....	324
Total Cases	118	....	....	....	....	....	....	....	....	....
Year 1964										
abony	1	1	....	....	....	....	....	....	....	1
adelaide	7	12	....	....	....	....	....	....	4	16
anatum	1	1	....	....	1	....	....	....	1	3
bovis-morbificans	2	2	....	....	....	....	....	2	....	4
bredeney	1	1	....	....	....	....	....	....	....	1
brisbane	1	1	....	....	....	....	....	....	....	1
chester	5	8	1	....	....	....	....	4	....	13
cholerae-suis	....	....	....	....	....	....	....	10	....	10
derby	....	....	....	....	1	....	....	....	....	1
emmastad	2	2	....	....	....	....	....	....	....	2
give	2	2	....	....	....	....	....	....	....	2
hvittingfoss	2	3	....	....	1	....	....	....	....	4
kimberley	2	2	....	....	....	....	....	....	....	2
lexington	1	1	....	....	....	....	....	....	....	1
litchfield	2	3	....	....	....	....	....	....	....	3
muenchen	13	28	....	1	1	....	....	....	2	32
newington	2	2	....	....	....	....	....	....	....	2
onderstepoort	5	5	....	....	....	....	....	....	....	5
oranienburg	4	4	....	....	....	....	....	....	....	4
orion	3	4	....	....	....	....	....	....	....	4
paratyphi—B	1	1	....	....	....	....	....	....	....	1
poona	....	....	....	....	....	....	....	....	1	1
potsdam	1	1	....	....	....	....	....	....	....	1
saint-paul	5	8	....	....	....	....	....	....	....	8
senftenburg	1	1	....	....	....	....	....	....	1	2
tennessee	9	10	....	....	....	....	....	....	....	10
typhi	1	....	2	....	....	....	....	....	....	2
typhimurium	59	61	....	....	....	....	....	8	1	70
urbana	1	1	....	....	....	....	....	....	....	1
wandsbek	4	5	....	....	....	....	....	....	....	5
wandsworth	5	5	....	....	....	....	....	....	....	5
welikade	3	3	....	....	....	....	....	....	2	5
zehlendorf	1	1	....	....	....	....	....	....	....	1
Total Isolations	....	179	3	1	4	....	....	24	12	223
Total Cases	137	....	....	....	....	....	....	....	....	....

SALMONELLA SEROTYPES ISOLATED FROM VARIOUS SOURCES—*continued*

Serotype	Human			Foods				Animals Reptiles, Birds, Fish, etc. (Other than Human Food)	Mis-cellaneous	Total Isolations
	Cases	Faeces	Miscel-laneous	Meat	Fish	Egg	Veget-able			
Year 1965										
abony	4	4	....	....	....	....	....	....	....	4
adelaide	8	10	....	7	....	....	....	....	1	18
alsterdorf	1	1	....	....	....	....	....	....	....	1
anatum	4	4	....	7	....	....	....	....	....	11
birkenhead	....	....	....	....	....	....	....	1	....	1
bleadon	1	1	....	....	....	....	....	....	....	1
bovis-morbificans	....	....	....	....	....	....	....	5	1	6
california	1	1	....	....	....	....	....	....	....	1
chester	4	8	....	18	....	....	....	2	....	28
cholerae-suis	2	2	....	....	....	....	....	7	....	9
derby	2	2	....	....	....	....	....	....	....	2
eastbourne	4	7	....	....	....	....	....	....	....	7
emmastad	1	1	....	....	....	....	....	....	....	1
enteritidis	....	....	....	2	....	....	....	....	....	2
give	3	3	....	....	....	....	....	....	....	3
heidelburg	1	1	....	....	....	....	....	....	....	1
hvittingfoss	7	9	....	....	....	....	....	....	....	9
jangwani	5	7	....	....	....	....	....	....	....	7
litchfield	3	9	....	....	....	....	....	....	....	9
muenchen	21	30	....	5	....	....	....	....	....	35
new-brunswick	1	1	....	....	....	....	....	....	....	1
newington	2	2	....	....	....	....	....	....	....	2
ohlstedt	2	3	....	....	....	....	....	....	....	3
onderstepoort	1	3	....	....	....	....	....	....	....	3
oranienburg	7	7	....	5	....	....	....	....	....	12
orientalis	....	....	....	....	....	....	....	....	1	1
orion	3	3	....	5	....	....	....	....	....	8
paratyphi—B	2	2	....	....	....	....	....	....	....	2
poona	1	1	....	....	....	....	....	....	....	1
pullorum	....	....	....	....	....	4	....	12	....	16
saint-paul	2	2	....	....	....	....	....	....	....	2
san-diego	5	5	....	....	....	....	....	....	....	5
senftenburg	2	3	....	....	....	....	....	....	....	3
singapore	....	....	....	....	....	....	....	....	1	1
tennessee	3	3	....	....	....	....	....	....	....	3
typhi	2	....	2	....	....	....	....	....	....	2
typhimurium	37	59	....	....	....	1	....	18	1	79
urbana	1	1	....	....	....	....	....	....	....	1
wandsbek	10	12	....	....	....	....	....	....	....	12
Total Isolations	....	207	2	49	....	5	....	45	5	313
Total Cases	153	....	....	....	....	....	....	....	....	....
Year 1966										
abony	9	18	....	....	....	....	....	....	....	18
adelaide	9	19	....	10	....	....	....	1	1	31
anatum	7	10	....	1	....	....	....	5	1	17
bahrenfeld	10	15	....	....	....	....	....	....	....	15
ball	1	1	....	....	....	....	....	....	....	1
birkenhead	2	5	....	....	....	....	....	....	....	5
bredeney	7	11	....	....	....	....	....	....	....	11
brisbane	3	4	....	....	....	....	....	....	....	4
butantan	1	1	....	....	....	....	....	....	....	1
chester	27	47	....	9	....	....	....	2	2	60
derby	....	....	....	....	....	....	....	....	1	1
eastborne	2	2	....	....	....	....	....	....	....	2
enteritidis	3	3	....	2	....	....	....	....	....	5
give	2	2	....	....	....	....	....	1	....	3
hauten	....	....	....	1	....	....	....	....	....	1
havana	1	1	....	10	....	....	....	....	....	11
hilversum	....	....	....	....	1	....	....	....	....	1
hvittingfoss	4	10	....	....	....	....	....	....	....	10
infantis	1	1	....	....	....	....	....	....	....	1
inpraw	....	....	....	....	3	....	....	....	....	3
jangwani	6	16	....	....	....	....	....	....	....	16
kisarawe	....	....	....	....	....	....	....	6	....	6
kottbus	2	2	....	....	....	....	....	....	....	2
lansing	1	1	....	....	....	....	....	....	....	1
litchfield	3	3	....	....	....	....	....	....	....	3
mowanjum	....	....	....	....	....	....	....	1	....	1

SALMONELLA SEROTYPES ISOLATED FROM VARIOUS SOURCES—*continued*

Serotype	Human			Foods				Animals Reptiles, Birds, Fish, etc. (Other than Human Food)	Mis-cellaneous	Total Isolations
	Cases	Faeces	Miscel-laneous	Meat	Fish	Egg	Veget-able			
				Year 1966—continued						
muenchen	21	35	....	21	....	....	....	1	1	58
newington	1	1	....	....	....	....	....	....	....	1
newport	1	1	....	....	6	....	....	....	1	8
ohlstedt	1	3	....	....	....	....	....	....	....	3
oranienburg	9	17	....	1	....	....	....	1	3	22
orion	9	15	....	....	....	....	....	2	....	17
poona	3	3	....	....	....	....	....	....	....	3
pullorum	....	....	....	....	....	....	....	13	....	13
ramat-gan	....	....	....	....	1	....	....	....	....	1
rubislaw	3	5	....	....	....	....	....	1	....	6
saint-paul	1	1	....	....	....	....	....	....	....	1
san-diego	2	2	....	....	....	....	....	....	....	2
senftenburg	13	22	....	2	....	....	....	5	....	29
singapore	....	....	....	13	....	....	....	....	....	13
tennessee	6	16	....	....	....	....	....	1	....	17
typhimurium	71	119	....	13	....	....	....	14	....	146
typhi	2	7	....	....	....	....	....	....	....	7
urbana	1	1	....	....	....	....	....	....	....	1
wandsworth	1	1	....	....	....	....	....	1	....	2
welikade	1	1	....	....	....	....	....	....	....	1
weltevreden	....	....	....	....	1	....	....	....	....	1
O Group 47	....	....	....	....	....	....	....	3	....	3
Total Isolations	....	422	....	83	12	....	....	58	10	585
Total Cases	247	....	....	....	....	....	....	....	....	....

Salmonella Diagnostic and Reference Laboratory

PUBLIC HEALTH LABORATORY SERVICE

PERTH – WESTERN AUSTRALIA

Isolations of Salmonella and Arizona - 1967

CUMULATIVE INDEX

abony	1964, 1965, 1966, 1967
adelaide	1955, 1956, 1958, 1959, 1960, 1961, 1962, 1963, 1964, 1965, 1966, 1967
agodi	1958
alsterdorf	1962, 1965, 1967
amager	1958
amersfoort	1967
anatum	1955, 1956, 1957, 1958, 1959, 1960, 1961, 1962, 1963, 1964, 1965, 1966, 1967
angoda	1961
bahrenfeld	1966, 1967
ball	1961, 1962, 1966, 1967
bareilly	1958, 1960, 1961, 1967
berta	1957
birkenhead	1957, 1958, 1960, 1965, 1966, 1967
bleadon	1965
blukwa	1962, 1963, 1967
boecker	1967
bovis-morbificans	1955, 1956, 1958, 1959, 1960, 1961, 1962, 1963, 1964, 1965, 1966, 1967
braenderup	1958, 1961
bredeney	1958, 1962, 1964, 1966, 1967
brisbane	1963, 1964, 1966, 1967
bukavu	1967
bullbay	1967
butantan	1957, 1960, 1966
california	1965
cambridge	1957, 1958
champaign	1963, 1967
charity	1960, 1962, 1967
chester	1958, 1959, 1960, 1961, 1962, 1963, 1964, 1965, 1966, 1967
chingola	1961
chittagong	1961
cholerae-suis	1955, 1958, 1960, 1961, 1962, 1963, 1964, 1965, 1967
cubana	1958, 1962, 1967
dahlem	1960
decatur	1961
derby	1956, 1957, 1958, 1959, 1960, 1961, 1962, 1963, 1964, 1965, 1966, 1967
dublin	1967
eastbourne	1958, 1962, 1965, 1966, 1967
edinburgh	1957
eimsbuettel	1967
emmastad	1958, 1963, 1964, 1965, 1967
enteritidis	1961, 1963, 1965, 1966, 1967
ferlac	1960, 1961, 1962
fremantle	1958, 1959, 1963, 1967
give	1957, 1958, 1959, 1962, 1963, 1964, 1965, 1966, 1967
havana	1966, 1967
heidelburg	1965
halmstad	1958
heilbron	1963
hilversum	1966
houten	1967
hvittingfoss	1960, 1961, 1962, 1963, 1964, 1965, 1966, 1967
infantis	1966
inpraw	1966
jangwani	1958, 1963, 1965, 1966, 1967
kaapstad	1958
kentucky	1958
kibusi	1967
kimberley	1964, 1967
kisarwe	1966, 1967
kotte	1960, 1961
kottbus	1966
lansing	1966, 1967
lexington	1958, 1961, 1964
lindern	1962, 1967
litchfield	1962, 1964, 1965, 1966, 1967
meleagridis	1958, 1959, 1960, 1961
montevideo	1957
mowanjum	1966
muenchen	1957, 1958, 1959, 1960, 1961, 1962, 1963, 1964, 1965, 1966, 1967
muenster	1958, 1959, 1961
nashua	1967
nchnanga	1960, 1961
new-brunswick	1956, 1958, 1961, 1965, 1967
newington	1958, 1960, 1961, 1962, 1963, 1964, 1965, 1966, 1967
newport	1957, 1958, 1960, 1961, 1962, 1963, 1964, 1966, 1967
nyborg	1957, 1958

CUMULATIVE INDEX - continued

ohlstedt	1965, 1966, 1967
onderstepoort	1959, 1960, 1962, 1963, 1964, 1965, 1967
orienienburg	1957, 1958, 1959, 1960, 1961, 1962, 1963, 1964, 1965, 1966, 1967
orientalis	1959, 1960, 1962, 1963, 1965, 1967
orion	1956, 1958, 1959, 1961, 1962, 1963, 1964, 1965, 1966, 1967
paratyphi—A	1955, 1956, 1963
paratyphi—B	1956, 1957, 1958, 1960, 1961, 1962, 1963, 1964, 1965
perth	1957, 1961
poona	1956, 1963, 1964, 1965, 1966, 1967
potsdam	1958, 1960, 1963, 1964, 1967
pullorum	1957, 1958, 1959, 1960, 1961, 1962, 1963, 1965, 1966, 1967
ramat-gan	1966, 1967
reading	1958, 1960, 1961
rubislaw	1960, 1966, 1967
saarbruecken	1958
saint-paul	1958, 1962, 1964, 1965, 1966, 1967
san-diego	1957, 1958, 1961, 1965, 1966
selandia	1958
senftenburg	1958, 1959, 1960, 1961, 1962, 1963, 1964, 1965, 1966, 1967
singapore	1965, 1966, 1967
solna	1961
taksony	1958
tennessee	1961, 1963, 1964, 1965, 1966, 1967
thompson	1960
treforest	1967
typhi	1955, 1956, 1957, 1958, 1959, 1960, 1961, 1962, 1963, 1964, 1965, 1966, 1967
typhimurium	1955, 1956, 1957, 1958, 1959, 1960, 1961, 1962, 1963, 1964, 1965, 1966, 1967
urbana	1961, 1962, 1964, 1965, 1966, 1967
uzaramo	1967
vejle	1958
wandsbek	1962, 1964, 1965, 1967
wandsworth	1962, 1963, 1964, 1966, 1967
waycross	1960, 1961, 1967
welikade	1964, 1966, 1967
weltevreden	1961, 1966, 1967
worthington	1957, 1958, 1959
zehlendorf	1964
Salmonella 38, 1v : 1,6	1967
Salmonella 42.z :—	1967
Salmonella 44.z4,z23	1967
Salmonella 47.k :—	1967
Salmonella 48, eh : 1,5	1967
Salmonella group	1967
Arizona spp.	17 isolated

SALMONELLA SEROTYPES ISOLATED FROM VARIOUS SOURCES—1967

Serotype	Human			Foods			Animals, Reptiles, Birds, Fish, etc. (Other Than Human Food)	Miscellaneous	Total Isolations
	Cases	Faeces	Miscellaneous	Meat	Fish	Egg			
abony	6	10	....	....	....	....	4	....	14
adelaide	21	33	....	8	....	....	44	12	97
alsterdorf	....	....	....	....	....	....	4	....	4
amersfoort	....	....	....	1	....	....	....	....	1
anatum	11	11	....	1	....	....	4	13	29
bahrenfeld	....	....	....	1	....	....	1	....	2
ball	1	1	....	....	....	....	....	....	1
bareilly	1	1	....	....	....	....	....	1	2
birkenhead	....	....	....	....	....	....	1	....	1
blukwa	....	....	....	....	....	....	....	1	1
boecker	....	....	....	....	....	....	1	....	1
bovis-morbificans	7	17	....	1	....	....	5	7	30
bredeney	2	2	....	....	....	....	....	....	2
brisbane	2	3	....	....	....	....	....	....	3
bukavu	1	3	....	....	....	....	....	....	3
bullbay	....	....	....	....	....	....	4	....	4
champaign	....	....	....	....	....	....	6	....	6
charity	....	....	....	....	....	....	1	....	1
chester	21	31	....	4	....	10	60	21	126
cholerae-suis	1	1	....	....	....	....	14	....	15
cubana	....	....	....	....	....	....	....	3	3
derby	3	4	....	....	....	3	30	12	49
dublin	1	....	1	....	....	....	....	....	1
eastbourne	1	2	....	....	....	....	....	....	2
eimsbuettel	....	....	....	....	....	....	1	....	1
emmastad	3	3	....	....	....	....	1	....	4
enteritidis	3	6	....	....	....	....	3	4	13
fremantle	1	1	....	....	....	....	2	....	3
give	7	8	....	5	....	....	13	4	30
houten	....	....	....	....	....	....	1	....	1
havana	3	8	....	....	....	....	....	....	8
hvittingfoss	4	5	....	....	....	....	4	1	10
jangwani	4	5	....	....	....	....	....	....	5
kibusi	....	....	....	....	....	....	3	....	3
kimberley	4	5	....	....	....	....	....	....	5
kisarawe	....	....	....	....	....	....	4	....	4
lansing	4	4	....	....	....	....	....	....	4
lindern	....	....	....	....	....	....	2	....	2
litchfield	3	4	....	....	....	....	....	....	4
muenchen	36	85	....	10	....	2	26	7	130
nashua	....	....	....	....	....	....	5	....	5
new-brunswick	....	....	....	....	....	....	2	....	2
newington	4	11	....	1	....	....	4	8	24
newport	....	....	....	....	....	....	1	....	1
ohlstedt	1	1	....	....	....	....	3	1	5
onderstepoort	9	9	....	2	....	....	6	....	17
oranienburg	13	18	....	....	....	6	....	3	27
orientalis	....	....	....	....	....	....	4	2	6
orion	10	13	....	3	....	....	8	4	28
poona	1	2	....	....	....	....	....	....	2
potsdam	1	2	....	1	....	....	....	....	3
pullorum	....	....	....	....	....	2	....	....	2
ramat-gan	2	2	....	....	....	....	....	....	2
rubislaw	8	14	....	....	....	....	2	1	17
saint-paul	5	7	....	....	....	....	18	7	32
senftenburg	8	19	....	....	....	....	2	1	22
singapore	3	4	....	....	....	....	....	....	4
tennessee	6	6	....	....	....	....	1	9	16
treforest	2	2	....	....	....	....	....	....	2
typhi	2	2	....	....	....	....	....	....	2
typhimurium	151	321	....	34	1	....	37	64	457
urbana	....	....	....	....	....	....	1	....	1
uzaramo	....	....	....	....	....	....	....	1	1
wandsbek	....	....	....	....	....	....	4	5	9
wandsworth	10	12	....	....	....	....	....	....	12
waycross	....	....	....	1	....	....	....	1	2
welikade	1	1	....	....	....	....	....	....	1
weltevreden	....	....	....	....	....	....	....	8	8
Salmonella 42 : z :—	....	....	....	....	....	....	1	....	1
Salmonella 38 : lv : 1,6	....	....	....	....	....	....	....	1	1
Salmonella 44.z4,z23	....	....	....	....	....	....	....	1	1
Salmonella 47 : k :—	1	1	....	....	....	....	....	....	1
Salmonella 48.eh : 1.5.	2	3	....	....	....	....	....	....	3
Salmonella group	1	1	....	....	....	....	2	3	6
Arizona 1,33 : 23-21	....	....	....	....	....	....	4	....	4
Arizona 5 : 29–21	....	....	....	....	....	....	7	2	9

SALMONELLA SEROTYPES ISOLATED FROM VARIOUS SOURCES—*continued*

Serotype	Human			Foods			Animals, Reptiles, Birds, Fish, etc. (Other Than Human Food)	Miscellaneous	Total Isolations
	Cases	Faeces	Miscellaneous	Meat	Fish	Egg			
Arizona 5 : 29–30....	1	2	....	....	....	....	2	....	4
Arizona 15 : 24–31....	....	....	....	....	....	....	1	....	1
Arizona 16 : 23–25....	....	....	....	....	....	....	6	1	7
Arizona 16 : 23–37....	....	....	....	....	....	....	1	1	2
Arizona 16 : 27–25....	....	....	....	....	....	....	12	1	13
Arizona 26 : 23–21....	....	....	....	....	....	....	1	....	1
Arizona 26 : 24–25....	....	....	....	....	....	....	1	....	1
Arizona 26 : 26–25....	4	4	....	....	....	....	....	....	4
Arizona 26 : 33–	....	....	....	....	....	....	....	1	1
Arizona 26 : 33–31....	....	....	....	....	....	....	4	1	5
Arizona 28 : 23–25....	....	....	....	....	....	....	1	....	1
Arizona 28 : 32–28....	....	....	....	....	....	....	1	....	1
Arizona 29 : 24–31....	....	....	....	....	....	....	1	....	1
Arizona 29 : 29–25....	....	....	....	....	....	....	2	....	2
Arizona group	1	2	....	....	....	....	9	3	14
Total Isolations	....	712	1	73	1	23	393	216	1,419
Total Cases	398	....	....	....	....	....	....	....	....

Appendix II

Tuberculosis Control Branch

Annual Report for the Year Ended 31st December, 1966

New notifications of pulmonary disease for 1966, as compared with figures for the years back to 1961, show a decrease in incidence from 24.7 (1961) to 12.2 (1966) per 100,000 of population. The decline has been fairly uniform, although in 1962 there was a slight rise to 27.0.

Notifications of non-pulmonary disease have remained numerically fairly steady over the period, that is, the incidence of this type of case has fallen slightly along with population increase. Forty new cases were notified in 1961 and 32 in 1966.

The total overall incidence (that is including re-notifications and non-pulmonary disease) fell from 32.3 to 19.3 over the period.

NOTIFICATIONS TO THE TUBERCULOSIS REGISTER

Persons with disease due to atypical mycobacteria are entered on the Tuberculosis Register for statistical and other reasons mainly associated with problems of diagnosis.

Notifications received during the year have been classified according to the organisms producing disease and form of disease as follows :

Form	M.T.B. (human type)	Proven Atypical Mycobacteria Runyon Group			Bovine
		I	II	III	
Pulmonary (adult type)	118	2	3	7	1
Pleurisy with effusion	3	....	....	....	....
Non-Pulmonary :					
Glands	7	....	2	6	....
Genitourinary	12	....	....	....	1
Bone and Joint	5	....	....	....	....
Abdominal	2	....	....	....	....
Chest Wall	1	....	....	....	....

Nine of the above patients were transfers in from other States. Included also are 27 re-notifications (one in the atypical group).

AGE GROUPS INVOLVED

Figures two and three show rates in the various age groups for both sexes in 1961 and 1966. The reduction in the female rate has been quite marked, rates for the intervening years falling largely in the space between the two tracings. There is a suggestion that as time goes on the graph for adult females will take up a more or less horizontal position a short distance above the abscissa. In males the characteristic rise from the age of 50 onwards to an apex at about 65 years is still in evidence.

The incidence in children is now very low ; such cases as do occur are in the main glandular infections with atypical mycobacteria. Table nine lists these cases for the years 1961 through to 1966 according to the organism identified. It is seen that M. Battey was the organism involved in most bacillary positive cases and it is reasonable to assume on this evidence and additional evidence provided by comparative skin testing, that the majority of bacillary negative cases of glandular disease were also infected by Battey bacilli.

SOURCE OF NOTIFICATIONS

Examination of notified cases according to source of the report back to 1961 shows a decreasing tendency for private medical practitioners to notify these without first using Chest Clinic facilities for establishing diagnosis, and also a gradual fall-off in the proportion of patients detected through the activity of mass surveys.

BACILLARY POSITIVE CASES

Seventy-one per cent. of new cases in 1966 were proven by isolation and identification of the mycobacteria concerned. Percentages for previous years were :

1961	52%
1962	60%
1963	75%
1964	77%
1965	75%

Of the new bacillary positive cases diagnosed in 1966, in 84 the organism was identified as M. tuberculosis hominis, in two M. bovis, in two an atypical mycobacterium Group one (M. Kansasii), in five a scotochromogen (Group two) and in 13 M. Battey (Group three). No cases of infection due to M. avium have been reported.

REACTIVATIONS

There were 27 re-notifications in 1966, representing 15.9% of the total notifications. Of the 27, 19 had been proved to have active tuberculosis at the time of original notification and these can be accepted as true re-activations.

The following is a comparison with figures for the previous two years :

	Number of Re-notifications			Total For the Three Years
	1964	1965	1966	
(a) Diagnosis not confirmed at time of original notification (not true re-activations)	2	7	7	16
(b) Diagnosis confirmed at time of original notification (true re-activations)				
(1) Head never received chemotherapy	8	6	5	19
(2) Had received inadequate chemotherapy :—				
Without surgery	13	5	13	31
With surgery	5	2	1	8
(3) Had received adequate chemotherapy	....	2	....	2
(c) Other (transfers back to State, etc.)	2	3	1	6

These figures illustrate the relatively large proportion of re-activations now occurring in patients previously treated during the no-chemotherapy and inadequate-chemotherapy periods, that is up to about 1955.

The total of true re-activations (that is all cases under (b) above) for the three years was 60. This represents a relapse rate of seven per 1,000 per year in persons with previously documented episodes of tuberculosis.

STATE OF THE REGISTER

The " active " register is summarized in Table four. Two hundred and sixty-four names were removed from it during the year, 157 of these being placed on the file of previous cases. Nineteen patients left the State and fifty-four died.

Since 1961 the number of names on this register with pulmonary disease has been reduced from 1,349 (representing a prevalence rate of 183 per 100,000) to 840 (prevalence rate 100).

FILE OF PREVIOUS CASES

At the end of the year there were 3,072 names on the file of previous cases, that is persons resident in the State who previously had fully documented episodes of tuberculosis. This file is now almost complete. As already indicated there are approximately 20 relapses annually in this high-risk group.

DEATHS

Tuberculosis deaths accounted for 1.9 per 100,000. Causes were :

1. Progressive pulmonary infection due to :
   - (a) M. tuberculosis 5
   - (b) Battey organisms.... 3
2. Old healed tuberculosis with extensive fibrosis with or without other conditions 8

MASS COMPULSORY SURVEYS

In view of the persisting low incidence of disease in age groups under 26, from January, 1966, the lower limit for compulsory surveys was raised to 25 years. This has entailed checking the list of non-attenders against electoral rolls, in order to eliminate the under 25's before reminder notices are posted. This procedure is working fairly satisfactorily.

The active tuberculosis case rate for surveys conducted in 1966 was 0.26 per 1,000 persons x-rayed. Other conditions diagnosed during the survey were :

Bronchogenic carcinoma	4
Other malignant neoplasms	16
Pneumonia and pneumonitis	43
Lung cysts	4
Bronchiectasis	19
Pneumoconiosis (not previously recorded)	24
Hamartoma	4
Sarcoidosis	1
Heart conditions	133

The number of persons x-rayed—57,291—was considerably less than in previous years. Much time and effort was taken up in conducting a campaign in the sparsely populated North-West area. Mass surveys continued to be planned on a four and a half to five year repeating basis.

The following shires were surveyed :

Metropolitan Area :—

Shire of Bayswater
Shire of Bassendean
Shire of Swan Guildford
Town of Midland
Shire of Melville
Shire of East Fremantle
City of Fremantle

North-West Shires :—

Shire of Shark Bay
Shire of Exmouth
Shire of Carnarvon
Shire of Ashburton
Shire of Roebourne
Shire of Port Hedland
Shire of Upper Gascoyne
Shire of Murchison

PERSONS BORN OUTSIDE OF AUSTRALIA

Tables five and six show tuberculosis incidence in the non-Australian born and Australian-born for the period from 1961 to 1966, with details of rates in the various population groups according to country of birth. Over the whole period the rate for the non-Australian born was more than twice that in the Australian born, for both sexes.

SURVEY OF NEW ARRIVALS

Comprehensive surveys of new arrivals have presented some difficulties because ship and plane passenger lists supplied by the Immigration Department have not enabled us to eliminate returning Australians and temporary visitors. The following figures for 1966 show that only half those required to attend actually did so :

Estimated number of new arrivals required to attend	18,096	
Attended as a result of pamphlet distribution at disembarkation point	2,335	
Attended following a first reminder notice	6,826	
Attended following a second reminder notice	313	
Total	9,474	(52.4%)

Abnormalities discovered were :—

Pulmonary tuberculosis, active	4
Pulmonary tuberculosis, inactive or apparently inactive and brought under clinical supervision	61
Other conditions (excluding minor abnormalities)	35

Of the 61 persons mentioned above who were brought under supervision, three developed active tuberculosis during the first half of 1967.

As from January 1967, more accurate lists have been received from the Immigration Department. From these lists, names of returning Australians and visitors have been eliminated. This will improve the attendance rate.

DRUG RESISTANCE

The pattern of primary and secondary resistance has not changed. During 1966 three patients showed primary resistance to P.A.S. Few patients developed secondary resistance, their disease being satisfactorily controlled by the use of ancillary drugs. Ethionamide, Pyrazinamide and Ethambutol were the main standbys and were also used with effect on patients who had major difficulties with first-line drugs. Ethambutol appears to be a very useful ancillary drug.

HOSPITALIZATION AND DOMICILIARY TREATMENT

Early hospitalization following diagnosis continued to be the rule. The average period of stay for patients with minimal disease was three to four months and for advanced cases seven to eight months. Patients residing in country areas were required to prolong their stay owing to difficulty in arranging domiciliary drug supervision.

Sixty-four per cent of patients receiving domiciliary treatment during 1966 were considered by the visiting clinic sisters to be reliable drug takers. Sixteen per cent were judged to be definitely unreliable and in the remaining 20 per cent there was some doubt as to reliability.

ATYPICAL MYCOBACTERIA IDENTIFICATIONS

Table eight shows patients from whom these organisms were isolated for the first time. Since 1961 identifications of atypical mycobacteria have been made from the following patients :

1961	112
1962	81
1963	105
1964	105
1965	51
1966	85
Total Patients	539

Most isolations have been made from sputum specimens, many of which have been provided by patients with chronic lung conditions other than mycobacterial.

ATYPICAL TUBERCULOSIS

The number of cases of pulmonary disease due to Battey organisms (seven) during the year was less than in previous years, as can be seen from the following table, which shows all patients who have satisfied the criteria for diagnosis of atypical tuberculosis since 1955, when the possibility of such infections was first clearly recognised. The incidence of pulmonary Battey disease appears to have become established at one to two per 100,000 of population.

Year	Runyon Group 1	Runyon Group 2			Runyon Group 3 (Battey)		
	Pulm	Pulm	Lymph Nodes	Total	Pulm	Lymph Nodes	Total
1955	....	....	....	....	1	....	1
1956	....	....	....	....	1	....	1
1957	....	....	....	....	1	....	1
1958	....	....	....	....	4	1	5
1959	....	....	....	....	10	2	12
1960	....	1	....	1	11	1	12
1961	....	2	....	2	11	1	12
1962	....	1	3	4	8	2	10
1963	....	3	....	3	17	3	20
1964	....	6	....	6	14	3	17
1965	2	2	....	2	13	1	14
1966	2	3	2	5	7	6	13
Total	4	18	5	23	98	20	118

In addition, one patient had Group 4 pulmonary disease in 1960 and one patient had mixed Group 1 (M. Kansasii) and Group 3 pulmonary disease in 1963.

These patients continue to present problems since by the time diagnosis is established and the organism concerned is typed and its drug sensitivites determined, investigations have been under way for two or three months, during which time the patient will have been accommodated in a ward along with true tuberculosis cases and have received an initial course of drugs to which the organism has been resistent from the outset. The use of more specific antigens and acceleration of culture and sensitivity procedures would facilitate diagnosis and treatment. With regard to drug treatment of these patients, Ethambutol offers some promise provided that the organisms concerned are sensitive to this drug. It is used with B 663 or occasionally Ethionamide. Thoracoplasty may be undertaken with reasonable success in controlling disease. Resection on the whole has not proved satisfactory.

F. G. B. EDWARDS, B.A., LL.B. M.B., B.S., F.C.C.P.
Director, Tuberculosis Control Branch.

Table 1

TUBERCULOSIS—MAIN STATISTICAL FIGURES

Year	Mean Population 1,000s.	Notifications				No. on Register (Pulm.) at 31st Dec.	No. on Register per 100,000 (Pulm.)	Number Receiving T.B. Allowance at 31st Dec.	Deaths			Death Rate per 100,000	
		Pulm. (incl. Pleural effus.)	Non-Pulm.	Total	Pulm. per 100,000				Pulm.	Non-Pulm.	Total	Pulm.	All Forms
1950	558	586	18	604	104.8	2,100	376	515	125	3	128	22.4	22.9
1951	580	467	37	504	80.4	2,402	413	474	76	6	82	13.1	14.1
1952	601	508	49	557	84.5	2,574	428	396	75	7	82	12.5	13.6
1953	621	378	34	412	60.6	2,762	445	361	43	3	46	6.9	7.4
1954	640	348	34	382	54.3	2,769	432	326	57	4	61	8.9	9.5
1955	659	413	39	452	62.7	2,965	450	330	31	2	33	4.7	5.0
1956	677	424	44	468	62.6	2,900	428	264	43	3	46	6.3	6.8
1957	692	332	32	364	47.9	2,786	403	198	36	1	37	5.2	5.3
1958	706	355	24	379	50.3	2,726	386	213	22	4	26	3.1	3.4
1959	726	320	34	354	44.1	2,684	369	182	24	....	24	3.3	3.3
1960	731	296	34	330	40.5	2,388	327	148	29	1	30	4.0	4.1
1961	737	209	41	250	28.4	1,349	183	89	18	1	19	2.4	2.6
1962	755	243	25	268	32.2	1,333	177	90	24	4	28	3.2	3.7
1963	773	216	28	244	27.9	1,218	158	92	13	....	13	1.7	1.7
1964	790	176	32	208	22.3	1,221	154	88	20	....	20	2.5	2.5
1965	806	153	25	178	19.0	919	114	65	12	....	12	1.5	1.5
1966	836	134	36	170	16.0	840	100	64	16	....	16	1.9	1.9

Table 2

ANNUAL NOTIFICATIONS OF PULMONARY TUBERCULOSIS SHOWING STAGE OF DISEASE*

Year	Parenchymal Disease						Pleural Effusion		Total
	Minimal		Moderately Advanced		Advanced				
		%		%		%		%	
1952	122	24.0	275	54.1	101	19.9	10	2.0	508
1953	98	25.9	210	55.5	65	17.2	5	1.4	378
1954	96	27.6	178	51.1	74	21.3	....	....	348
1955	111	26.9	225	54.5	64	15.5	13	3.1	413
1956	127	38.0	217	51.1	72	17.0	8	1.9	424
1957	102	30.7	163	49.1	61	18.4	6	1.8	332
1958	91	25.6	187	52.7	72	20.3	5	1.4	355
1959	103	32.2	151	47.2	55	17.2	11	3.4	320
1960	89	30.1	144	48.6	49	16.6	14	4.7	296
1961	90	43.1	73	34.9	34	16.3	12	5.7	209
1962	117	48.1	84	34.6	36	14.8	6	2.5	243
1963	99	45.8	89	41.2	26	12.0	2	1.0	216
1964	71	40.3	81	46.0	23	13.1	1	0.6	176
1965	75	49.0	60	39.2	17	11.1	1	0.7	153
1966	59	44.0	54	40.3	18	13.4	3	2.2	134

* Classified according to Diagnostic Standards N.T.A.

Table 3

TUBERCULOSIS NOTIFICATIONS FOR THE YEAR ENDED 31 DECEMBER, 1966

Showing Age, Sex, Form and Stage of Disease

Group	Males					Females					Persons					Total
	Pulmonary			Non-Pulm.	Pleur. Effus.	Pulmonary			Non-Pulm.	Pleur. Effus.	Pulmonary			Non-Pulm.	Pleur. Effus.	
	Min.	Mod.	Adv.			Min.	Mod.	Adv.			Min.	Mod.	Adv.			
0- 4	....	....	....	5	....	1	....	....	6	....	1	....	....	11	....	12
5- 9	....	....	....	....	....	....	....	....	2	....	....	....	....	2	....	2
10–14	....	....	....	1	....	....	....	....	....	....	....	....	....	1	....	1
15–19	1	....	....	1	....	....	1	....	....	1	1	1	....	1	1	4
20–24	1	....	1	2	....	1	....	1	1	....	2	....	2	3	....	7
25–29	3	1	1	....	....	....	1	....	....	....	3	2	1	....	....	6
30–34	3	2	1	....	....	....	....	....	1	....	3	2	1	1	....	7
35–39	1	....	....	3	....	2	....	1	2	....	3	....	1	5	....	9
40–44	6	8	....	2	....	1	2	1	1	....	7	10	1	3	....	21
45–49	4	1	2	....	....	1	1	....	....	....	5	2	2	....	....	9
50–54	7	5	2	3	1	....	1	1	....	....	7	6	3	3	1	20
55–59	8	6	1	1	....	....	1	....	1	....	8	7	1	2	....	18
60–64	3	5	2	....	1	....	2	....	1	....	3	7	2	1	1	14
65–69	7	11	3	....	....	....	1	....	....	....	7	12	3	....	....	22
70–74	4	1	....	2	....	....	1	....	1	....	4	2	....	3	....	9
75-	4	1	1	....	....	1	2	....	....	....	5	3	1	....	....	9
Total	52	41	14	20	2	7	13	4	16	1	59	54	18	36	3	170

Table 4

ANALYSIS OF REGISTER AS AT 31st DECEMBER, 1966

A. Pulmonary Tuberculosis (excluding Pleural Effusions)

Activity	Number on Register according to original extent of lesions			Total
	Minimal	Moderate	Advanced	
Active	91	77	29	197
Inactive—				
0–1 year	24	31	9	64
1–2 years	50	50	9	109
2–3 years	57	60	20	137
3–4 years	100	69	14	183
4–5 years	62	53	22	137
5+ years	....	4	1	5
Total	384	344	104	832

B. Pleural Effusions	8
C. Non-Pulmonary Tuberculosis	134
Total (all forms)	974

Table 5

WESTERN AUSTRALIA: TUBERCULOSIS INCIDENCE BY COUNTRY OF BIRTH, 1961–1966: MALES

Country of Birth	Population at June 30, 1961: Thousands (Census)	Incidence per Thousand Persons						Total Notifications, 1961–1966
		1961	1962	1963	1964	1965	1966	
United Kingdom and Republic of Ireland	44.4	0.92	0.93	0.66	0.67	0.61	0.59	194
Germany	2.7	0.74	0.37	....	....	....	0.75	5
Greece	2.3	0.87	0.87	0.43	....	....	....	5
Italy	14.9	1.01	0.91	0.70	0.60	0.47	0.20	59
Netherlands	6.2	0.16	0.64	0.31	....	0.16	0.16	9
Poland	2.8	2.50	0.33	1.85	1.07	....	0.71	18
Yugoslavia	3.6	1.39	1.08	1.58	1.11	1.11	1.94	30
Other European	5.7	1.40	1.05	0.70	1.05	0.70	1.40	36
Other Birthplaces	8.1	0.86	1.09	1.19	0.74	1.23	0.61	47
Total non-Australian born	90.7	0.97	0.89	0.74	0.64	0.58	0.59	403
Australian-born *	284.8	0.30	0.37	0.34	0.31	0.22	0.26	537

* Full-blood aborigines excluded.

Table 6

WESTERN AUSTRALIA : TUBERCULOSIS INCIDENCE BY COUNTRY OF BIRTH, 1961-1966 : FEMALES

Country of Birth	Population at June 30, 1961: Thousands (Census)	Incidence Per Thousand Persons						Total Notifications 1961–1966
		1961	1962	1963	1964	1965	1966	
United Kingdom and Republic of Ireland	38.9	0.23	0.29	0.31	0.26	0.36	0.15	62
Germany	2.9	0.34	....	0.34	....	....	0.34	3
Greece	1.8	0.55	0.52	0.50	1.11	....	....	5
Italy	10.3	0.68	0.27	0.26	0.09	0.58	0.29	23
Netherlands	5.0	....	0.39	....	....	....	....	2
Poland	1.9	0.53	0.56	....	2.10	....	....	6
Yugoslavia	2.3	....	1.67	1.60	....	0.43	....	9
Other European	4.0	0.75	0.73	....	0.25	0.75	0.75	13
Other Birthplaces	6.6	0.45	0.29	0.14	0.45	0.15	0.15	11
Total non-Australian born	73.7	0.34	0.36	0.29	0.28	0.34	0.19	134
Australian-born*	287.4	0.16	0.16	0.13	0.14	0.12	0.09	232

* Full-blood aborigines excluded

Table 7

NOTIFICATIONS OF BRITISH FULL-FARE PAYING PASSENGERS

Year of Notification	Persons Notified				Total
	Within One Year of Arrival	One to Five Years after Arrival	Five to Ten Years after Arrival	More than Ten Years after Arrival	
1958	1	6	3	59	69
1959	4	1	6	32	43
1960	1	1	4	44	50
1961	2	2	3	35	42
1962	2	2	1	24	29
1963	2	....	1	13	16
1964	3	2	1	13	19
1965	3	1	1	8	13
1966	....	2	2	12	16
Total	18	17	22	240	297

Table 8

PATIENTS FROM WHOM ATYPICAL MYCOBACTERIA WERE ISOLATED (FOR THE FIRST TIME) IN 1966

Runyon Group	Casual Isolations	Intermittent Isolations	Persistent Isolations				Total
			Atypical Tuberculosis			Other	
			Pulm.	Non-pulm.	Total		
1	2	....	2	....	2	....	4
2	9	....	3	2	5	1	14
3	38	1	7	5	12	6	51
4	9	....	....	....	....	....	9
Total Patients	58	1	12	7	19	7	78

Table 9

CHILDREN NOTIFIED WITH MYCOBACTERIAL DISEASE OF LYMPH NODES

Year	Scotochromogens Identified (Runyon Group 2)	Battey Organisms Identified (Runyon Group 3)	M. TB. (Human) Identified	Cultures Negative
1961	....	1	....	1
1962	3	2	....	2
1963	....	3	....	8
1964	....	3	1	4
1965	....	1	....	5
1966	2	6	....	7
Total number of children	5	16	1	27

Graph Showing the Source of Notification of Cases of Pulmonary Tuberculosis as a Percentage of Total Notifications

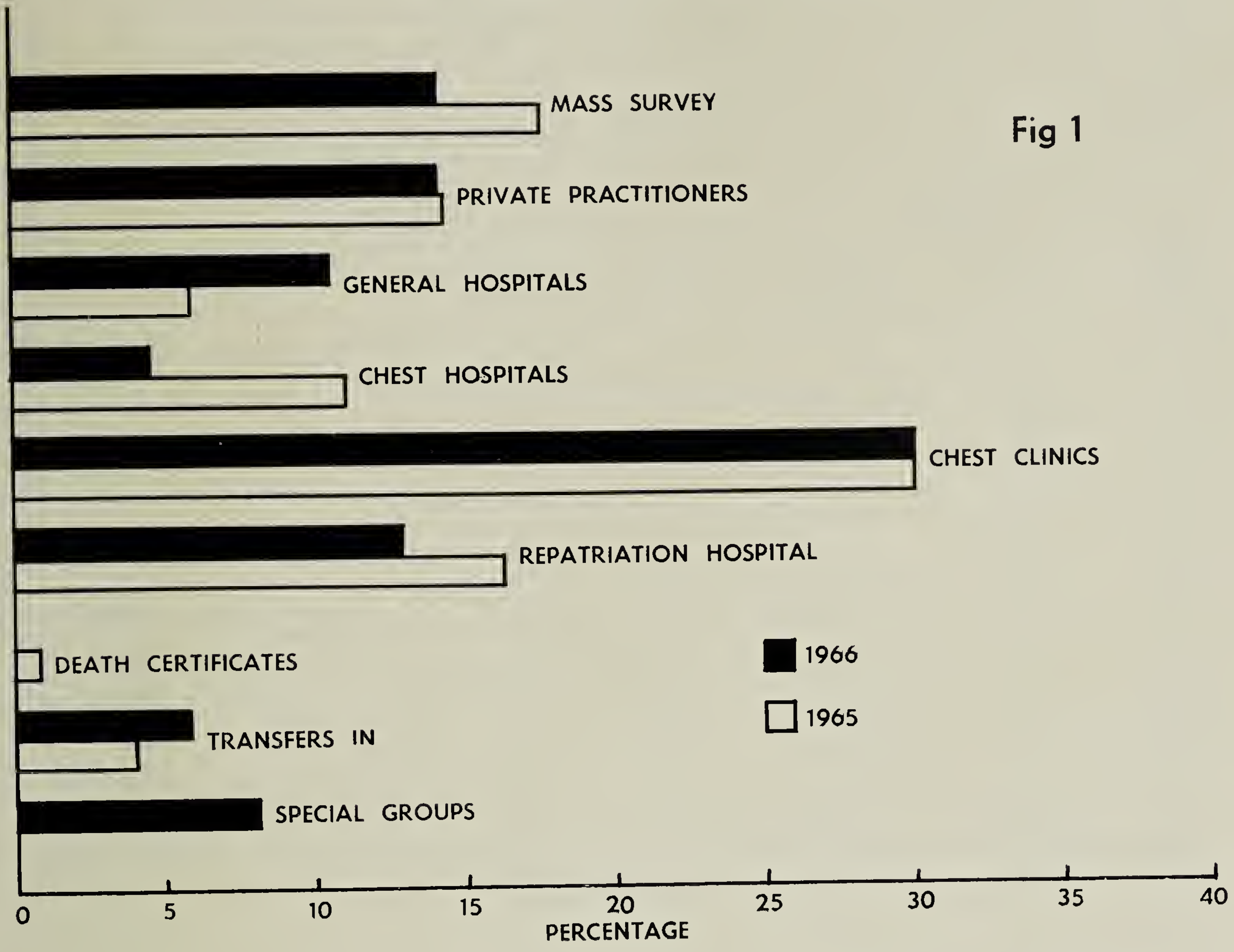


Fig 1

Graph Showing Incidence per 1000 in Age Groups for Pulmonary Tuberculosis 1961 and 1966—Males

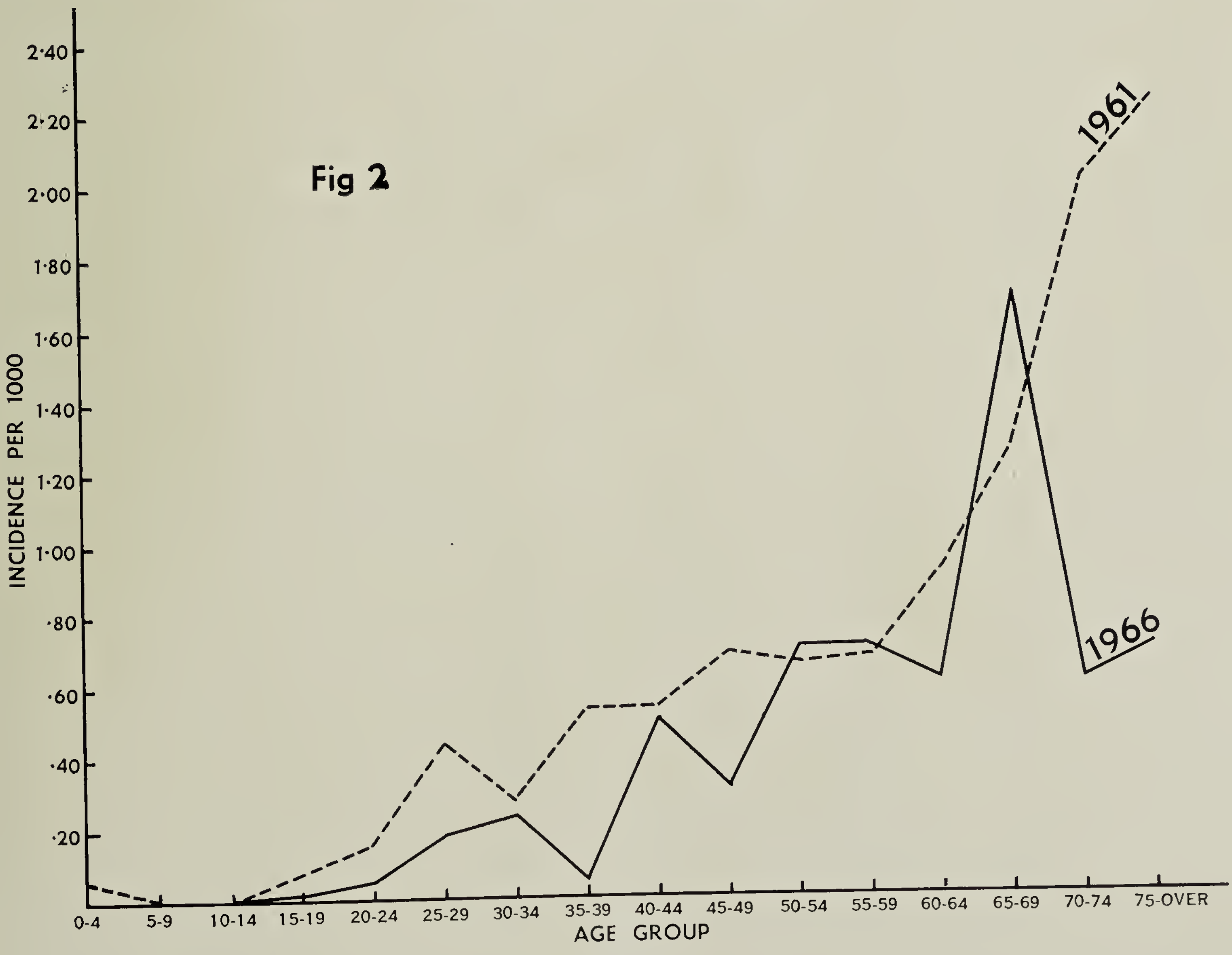
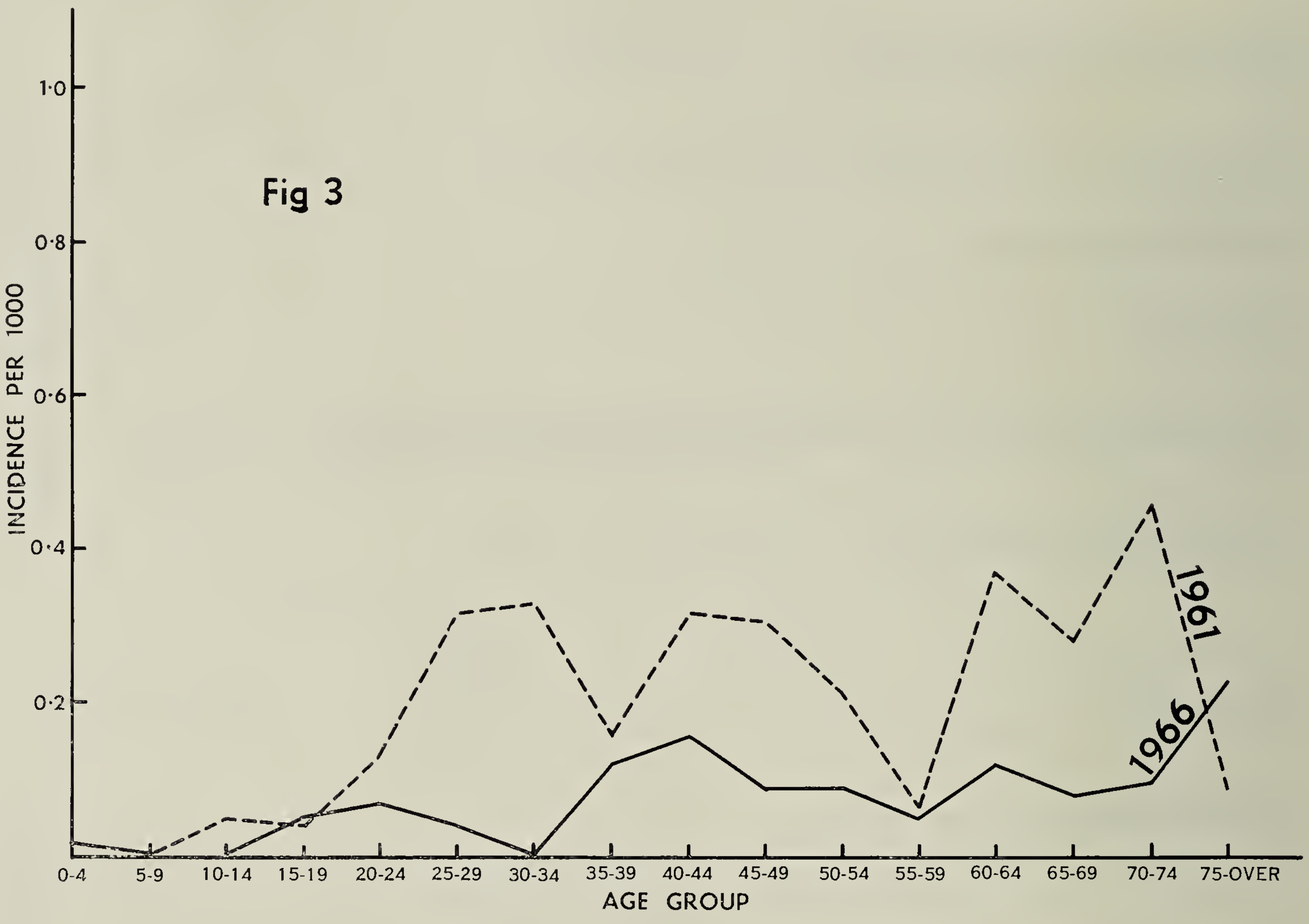


Fig 2

Graph Showing Incidence per 1000 in Age Groups for Pulmonary Tuberculosis 1961 and 1966—Females



Appendix

Western Australia

Pulmonary Tuberculosis

Year	Population in 1,000s	Notifications Received	Incidence Rate per 100,000 Population	Deaths Registered	Mortality Rate per 100,000 Population
1911	287	259	90.2	190	66.2
1912	301	429	142.5	220	73.1
1913	313	424	135.5	206	65.8
1914	323	353	109.3	229	70.9
1915	321	336	104.7	233	72.6
1916	313	511	163.5	225	71.9
1917	306	464	151.6	217	70.9
1918	308	432	140.5	245	79.5
1919	320	467	145.9	289	91.6
1920	330	442	133.9	259	78.4
1921	334	424	126.9	277	82.9
1922	341	387	113.8	256	75.1
1923	351	361	102.8	216	61.5
1924	363	381	104.6	228	62.8
1925	373	403	108.4	259	69.4
1926	381	415	108.2	252	66.1
1927	392	409	104.3	231	56.4
1928	408	395	96.8	282	69.1
1929	421	400	95.0	245	53.4
1930	429	569	132.6	218	50.8
1931	432	372	86.1	223	51.6
1932	435	339	77.9	203	46.7
1933	439	295	67.2	207	47.2
1934	442	287	64.9	218	49.3
1935	447	270	60.4	210	47.0
1936	452	338	74.8	193	42.7
1937	457	239	53.0	172	37.6
1938	464	247	53.2	177	38.1
1939	470	202	43.0	179	38.1
1940	473	231	48.8	181	38.3
1941	474	154	32.5	185	39.0
1942	477	113	23.7	175	36.7
1943	477	273	57.3	144	30.2
1944	481	219	45.4	134	27.9
1945	488	271	55.5	149	30.5
1946	493	343	69.6	163	33.1
1947	502	372	74.0	128	25.4
1948	515	325	63.1	157	30.5
1949	533	499	93.6	123	23.1
1950	558	586	104.8	129	23.1
DEATH CLASSIFICATIONS ACCORDING TO 6TH (1948) INTERNATIONAL LIST.					
1950	558	586	104.8	125	22.4
1951	580	467	80.4	76	13.1
1952	601	508	84.5	75	12.5
1953	621	378	60.6	43	6.9
1954	640	348	54.3	57	8.9
1955	659	413	62.7	31	4.7
1956	677	424	62.6	43	6.3
1957	692	332	47.9	36	5.2
1958	706	355	50.3	22	3.1
1959	726	320	44.1	24	3.3
1960	731	296	40.5	29	4.0
1961	737	209	28.4	18	2.4
1962	755	243	32.2	24	3.2
1963	773	216	27.9	13	1.7
1964	790	176	22.3	20	2.5
1965	806	153	19.0	12	1.5
1966	836	134	16.0	16	1.9

Appendix III

Epidemiology and Special Services

The reported incidence of notifiable diseases during 1966, showed a further decline in almost all instances, and certain of these diseases such as Typhoid Fever, Tetanus, Poliomyelitis and Diphtheria, which in the past have been regarded as major Public Health problems because of their prevalence or severity, may now be looked upon as comparative rarities.

IMMUNISATION

Poliomyelitis

77,396 injections of Salk Vaccine were administered during the year, taking the total injections since the commencement of the campaign in July, 1956, to over two million.

Apart from some inconvenience caused on two occasions during the year by shortages of vaccine supplies from Melbourne, the programme continued smoothly in both country and metropolitan areas. The Mobile Clinics have now become well known sights in country towns, and the service they provide is accepted and appreciated by local residents.

Over three years have passed since a case of poliomyelitis was reported in this State, and the significance of this may be realized when it is remembered that 399 confirmed cases were notified during the first half of 1956 before the Salk vaccination campaign commenced.

It is now certain that Sabin Oral Poliomyelitis Vaccine will be introduced into Western Australia during 1967, and all persons will be advised to receive the full course of three doses regardless of previous Salk injections. This vaccine, as well as conferring individual protection, tends to eliminate the symptomless carrier from the community and so lessen the risk of isolated poliomyelitis outbreaks in the future.

With the introduction of this Oral Vaccine it is anticipated that the Salk Vaccine requirements will decrease rapidly to negligible amounts.

Other Diseases

Immunisations involving the use of vaccines other than Salk increased again by almost 50 per cent. for the year and totalled 27,878.

MEDICAL EXAMINATIONS

Eight hundred and forty medical examinations were carried out during 1966 for male applicants to the State Public Service.

TRACHOMA CONTROL

The Trachoma Field Teams visited the Murchison, Eastern Goldfields and Great Southern areas of the State during the year, adhering to the policy of revisiting the main centres every eighteen months.

Activity of the disease in most age-groups has shown a further slight decrease (Table 2) and percentage activity of those examined has now declined from 56.8 per cent. in 1962 to 36.2 per cent. in 1966.

VENEREAL DISEASE

The increasing incidence of Venereal Disease is causing concern in all Australian States and many overseas countries. The notifications in Western Australia during 1966 totalled 710, of which 690 related to Gonorrhoea, compared with 462 (Gonorrhoea 453) for the previous year, while 1967 figures show a further increase to 839 (Gonorrhoea 796).

Analysis of the 1966 notifications shows a ratio of male to female cases of 6 . 5 : 1, suggesting that there may be a reservior of undetected infection among females in the community. In 1967 this ratio dropped to 4 . 9 : 1, as notifications of females increased by 50 per cent. from 95 to 143—mainly in the younger age groups.

The proportion of venereal disease among teenagers shows a significant sex variation. In 1966, 16.4 per cent. of male cases and 41.1 per cent. of females occurred in the 15–19 year age group. In 1967, the respective percentages were 19.8 per cent. for males and 43.4 per cent. for females.

Many reasons have been postulated to explain the current pandemic of Venereal Disease—lack of parential control, absence of organized sex education, excess leisure time, access to reliable oral contraceptives, availability of simple effective treatment, widespread ownership of motor cars among the younger age groups, and the present cult of near—pornography in films, television, advertising literature and art.

It is certain that no single cause can be pin-pointed, and as yet no country with this problem has found an effective and lasting method of dealing with it.

R. ALLEN,
Senior Medical Officer, Epidemiology.

ANNUAL SALK INJECTIONS SINCE 1st JULY, 1956

Year	No. of Injections
1956	224,466
1957	415,166
1958	273,017
1959	309,914
1960	140,590
1961	59,964*
1962	177,989
1963	203,754
1964	68,641
1965	61,243
1966	77,396
Total	2,012,140

* Includes 10,134 Quadruple Antigen injections in 1961.

ANALYSIS OF SALK INJECTIONS

1st July, 1956, *to* 31*st December,* 1966

Age Group	4th Injection	3rd Injection	2nd Injection	1st Injection	Total Injections
Under 15 years	173,699	295,634	337,393	355,619	1,162,345
Over 15 years	118,134	221,545	237,333	262,649	839,661
Total, all Ages	291,833	517,179	574,726	618,268	2,002,006

In addition to the above total, 10,134 injections of Quadruple Antigen (containing Salk Vaccine) were given in 1961, making the grand total of 2,012,140 separate injections.

SALK VACCINATION STATUS

Ages adjusted to 31st December, 1966.

Age Groups	Number of Persons who have received				
	Four Injections	Three Injections Only	Two Injections Only	One Injections Only	1st, 2nd. 3rd. and 4th Injections
Under 15 years	167,556	95,444	33,438	18,032	314,470
Over 15 years	124,277	129,902	24,109	25,510	303,798
Total, all Ages	291,833	225,346	57,547	43,542	618,268

POLIOMYELITIS INCIDENCE

(Since Salk Vaccination began on 1st July, 1956)

Year	Not Vaccinated		Vaccinated		Total
	Non-Paralytic	Paralytic	Non-Paralytic	Paralytic	
1956	1	1	....	....	2
1957	....	3	....	....	3
1958	....	1	....	....	1
1959	....	2	....	3	5
1960	....	3	....	....	3
1961	....	2	....	....	2
1962	....	3	....	1	4
1963	....	3	....	2	5
1964	....	....	....	....	....
1965	....	....	....	....	....
1966	....	....	....	....	....
Total	1	18	....	6*	25

*	
1 dose	2
2 doses	1
3 doses	2
4 doses	1

POLIOMYELITIS INCIDENCE (continued)

Case No.	Year	Sex	Age	Virus Type	Vaccination Status
1	1956	M.	24	....	Unvaccinated
2	1956	M.	28	....	Unvaccinated
3	1957	M.	7	....	Unvaccinated
4	1957	M.	10	....	Unvaccinated
5	1957	M.	23	....	Unvaccinated
6	1958	M.	40	....	Unvaccinated
7	1959	M.	2	III	3 doses (onset 3 days after third dose)
8	1959	M.	3/12	....	Unvaccinated
9	1959	M.	2	....	2 doses
10	1959	F.	3	....	1 dose
11	1959	M.	7	III	Unvaccinated
12	1960	M.	7/12	....	Unvaccinated
13	1960	M.	3	I	Unvaccinated
14	1960	M.	1½	I	Unvaccinated
15	1961	F.	2	I	Unvaccinated
16	1961	M.	3	III	Unvaccinated
17	1962	F.	41	I	Unvaccinated
18	1962	F.	3	III	3 doses (onset 2 years after third dose)
19	1962	F.	28	III	Unvaccinated
20	1962	M.	37	III	Unvaccinated
21	1963	M.	11	III	Unvaccinated
22	1963	F.	35	....	1 dose
23	1963	M.	2	III	Unvaccinated
24	1963	M.	5	II	4 doses (onset 6 months after fourth dose)
25	1963	M.	26	II	Unvaccinated
	1964	Nil	....	....	....
	1965	Nil	....	....	....
	1966	Nil			

TRACHOMA ACTIVITY, 1966

Table 1

	0–4 Years			5–9 Years			10–14 Years			Over 14 Years			Total		
Area	Ex.	Act.	% Act.	Ex.	Act.	% Act.	Ex.	Act.	% Act.	Ex.	Act.	% Act.	Ex.	Act.	% Act.
Eastern Goldfields	319	209	65·5	357	182	51·0	273	59	21·6	204	3	1·5	1,153	453	39·3
Murchison	205	172	83·9	229	151	65·9	167	57	34·1	1	....	....	602	380	63·1
Lower Great Southern	218	79	36·2	269	18	6·7	175	4	2·3	2	....	....	664	101	15·2
Upper Great Southern	180	90	50·0	233	54	23·2	170	14	8·2	12	....	....	595	158	26·6
Total	922	550	59·7	1,088	405	37·2	785	134	17·1	219	3	1·4	3,014	1,092	36·2

Table 2

	0–4 Years			5–9 Years			10–14 Years			Over 14 Years			Total		
Year	Ex.	Act.	% Act.	Ex.	Act.	% Act.	Ex.	Act.	% Act.	Ex.	Act.	% Act.	Ex.	Act.	% Act.
1962	1,422	1,159	81·5	1,728	1,194	69·1	1,209	457	37·8	845	146	17·3	5,204	2,956	56·8
1963	718	493	68·7	679	405	59·6	414	114	27·5	192	15	7·8	2,003	1,027	51·3
1964	843	542	64·3	878	471	53·6	674	114	21·4	589	15	2·5	2,983	1,172	39·3
1965	1,073	675	62·9	1,199	534	44·5	869	122	14·0	113	1	0·9	3,254	1,332	40·9
1966	922	550	59·7	1,088	405	37·2	785	134	17·1	219	3	1·4	3,014	1,092	36·2

VENEREAL DISEASE, W.A., 1958–1967

Table 1

Year	Gonorrhoea	Syphilis	Granuloma	Chancroid	Total Venereal Disease
1958	148	5	....	1	154
1959	72	8	....	1	81
1960	87	6	....	....	93
1961	119	17	....	....	136
1962	283	16	....	....	299
1963	362	28	....	....	390
1964	392	11	....	....	403
1965	453	9	....	....	462
1966	690	20	....	....	710
1967	796	41	....	2	839
Total	3,402	161	....	4	3,567

Table 2

Year	Age Groups					
	15–19	20–24	25–29	30–34	35 and over	Age not stated
	%	%	%	%	%	%
1958	6	24	26	20	23	1
1959	7	25	15	19	32	2
1960	18	19	9	13	29	12
1961	10	30	17	18	22	3
1962	18	32	15	11	20	4
1963	24	30	13	11	21	1
1964	26	30	15	9	18	2
1965	23	31	17	10	16	3
1966	20	31	18	11	15	5
1967	24	25	16	12	20	3

Year	Male Age Groups					
	15–19	20–24	25–29	30–34	35 and Over	Age not Stated
1958	5	35	34	25	28	1
1959	3	21	12	14	19	2
1960	9	13	7	11	23	10
1961	13	35	20	19	30	4
1962	32	82	35	26	48	11
1963	64	94	43	29	59	8
1964	70	98	57	33	63	12
1965	73	118	73	44	62	13
1966	101	205	113	67	96	33
1967	138	184	115	84	152	23

Year	Female Age Groups					
	15–19	20–24	25–29	30–34	35 and Over	Age not Stated
1958	5	4	4	6	6	....
1959	2	....	....	2	5	....
1960	8	5	1	1	5	....
1961	....	5	3	5	2	....
1962	23	14	9	6	13	....
1963	27	23	8	12	18	5
1964	32	19	7	2	10	....
1965	33	20	8	1	16	1
1966	39	16	12	11	14	3
1967	62	28	21	14	15	3

Table 3

	Male					Female					Total				
	1963	1964	1965	1966	1967	1963	1964	1965	1966	1967	1963	1964	1965	1966	1967
SYPHILIS—															
Primary	6	2	3	12	24	6	4	1	2	5	12	6	4	14	29
Secondary	1	1	1	3	8	5	1	2	1	2	6	2	3	4	10
Tertiary	2	1	....	....	....	4	1	2	2	2	6	2	2	2	2
Congenital	1	....	....	....	....	3	1	....	....	....	4	1	....	....	....
Total— Syphilis	10	4	4	15	32	18	7	5	5	9	28	11	9	20	41
Gonorrhoea	287	329	379	600	662	75	63	74	90	134	362	392	453	690	796
Granuloma	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Chancroid	....	....	....	....	2	....	....	....	....	....	....	....	....	....	2
Total— Venereal Disease	297	333	383	615	696	93	70	79	95	143	390	403	462	710	839

Appendix IV

Endemic Disease in Natives (Kimberleys)

Dr. J. J. Elphinstone

The Last Desert Natives ?

A previous report described the physical condition of about fifty natives found in the Great Sandy Desert of Western Australia in April, 1964. In late October of the same year, I examined a further twenty-five at a desert airstrip. Commonwealth patrol officers had found twenty (1 to 20, below) in the salt Lake Percival area, and the other five at Well 31, on what was once the Canning stock route.

There are now so few natives, even in the remote parts of Australia, who are still living as they did before the white man came, that some notes on the physical condition of this small group may be of interest.

An anthropologist of our party, Mr. R. Tonkinson from the University of Western Australia, discovered their names and family relationships so that their future progress can be followed.

There were three men, ten women and twelve children. They were thin and muscular, as desert people always are, but looked adequately nourished. There were no signs of any specific deficiency. However, it should be understood that it had taken the patrol officers several weeks to bring them all together at the airstrip and meanwhile they had been provided with Government rations.

The following notes on their condition were made. Conditions were not ideal for medical examination—

			Weight in lbs.	Height in inches	
1. Gudu	M	10 years	56	55	Teeth mottled
2. Ngaga	F	7½ years	42	49	Trachoma active
3. Marawaru	F	5 years	25	39½	Teeth mottled Trachoma quiescent
4. Dadjaja	M	4 years	22	39	Nil of note
5. Djundju	F	Adult	70	60	Teeth decayed Trachoma active
6. Gulada	F	23 years	....	62	Teeth mottled Trachoma active
7. Gulada's Infant	....	3 months	....	25	Trachoma active
8. Mudailya	M	5 years	33	43½	Trachoma active
9. Bamba	F	40 years	84	63	Teeth decayed Right eye blind
10. Radudja	F	15 years	91	58	Gums hypertrophic
11. Ngabunganin	M	12 years	72	58	No trachoma
12. Yugunya	F	45 years	90	65	Trachoma healed with scarring Teeth eroded and decayed
13. Nyibi	F	Adult	78	63	Trachoma active Teeth decayed
14. Manga	F	3 years	28	37	Nill of note
15. Yiwali	F	16 years	72	62	Nil of note
16. Yadji	M	10 years	61	56	Trachoma active
17. Yidji	M	7 years	40	46	Teeth mottled No trachoma
18. Gandiba	M	40 years	74	64	Teeth decayed Trachoma active
19. Bagagayi	F	4 years	26	38	Early neural leprosy
20. Ngandji	F	40 years	....	....	Lepromatous leprosy
21. Tutra	F	65 years	....	....	Nil of note
22. Payana	F	20 years	76	66	Nil of note
23. Tinkarinana	M	18 years	112	70	Trachoma active
24. Tibi	M	10 years	66	56	Trachoma active
25. Yinayadu	M	25 years	140	71	Trachoma active

About half were suffering from trachoma. Dental decay was common. Three children and an adult had mottling of the dental enamel such as is usually attributed to excess fluoride. I saw no evidence of Yaws, but as the examination was less than exhaustive, it may have been missed. There is serological evidence of that possibility.

One women was in an advanced stage of Lepromatous Leprosy. Her four year old daughter had early neural leprosy affecting one hand. Both were admitted for treatment to Derby Leprosarium where the mother died some months later. The child recovered and was discharged to a mission.

It seems very unlikely that the leprosy had been acquired in the desert. It has not been found before among desert natives, so far as I know. Therefore, it was important to find out whether NGANDJI was a genuine desert native or a migrant from one of the stations on the fringes of the desert. The story eventually accepted as being most likely was that she came originally from a station north of the Sandy Desert, and had eloped with a desert native who had later died. Impressions were made of her footprint in an attempt to establish her identity, but the prints were not recognised.

The natives were not unduly pressed to permit blood samples to be taken, and only six co-operated with alacrity.

Number	Sex	Age	Hb. G	Eosinophils %	WR	VDRL	Reiter	Vit. B 12 mgm/ml.
9	F	40	13·5	4	—ue	+	=	720
10	F	15	12·6	17	++	+	++	448
15	F	16	13·8	4	anti-compl.		....	384
18	M	40	14·6	6	++	—ue	++	976
5	F	Adult	13·0	1	—ue	+	—ue	288
22	F	20	13·2	2	++	+	++	240

Leprosy

In the past three years, this puzzling disease has been further divested of its mantle of mystery and emotionalism by the success of Shepard and Rees in culturing the leprosy bacillus, for the first time, in the foot pads of mice. Together with the use of the electron microscope, this discovery has brought the study of leprosy from outer darkness into the main stream of medical research.

Any progress in leprosy research is followed with great interest by the Public Health Department because the Kimberley Division of this State has as high an incidence of leprosy as any part of the World, and higher than most. This, however, need not deter prospective settlers in the North because the disease occurs, almost exclusively, in the native population.

It is estimated that there are about 7,000 natives in the Kimberleys and about 600 have, or have had, leprosy. However, the disease is not spread evenly throughout the native population but, as mentioned in previous reports, affects mainly about fifty families, in whom two or more cases have occurred. In this sense it might be termed a " house-hold " disease.

The European population of the Kimberleys was 7,804 at the 1966 census, an increase of 2,000 since 1961. Therefore, about four per cent. of the total Kimberley population have had lepsosy at some time, but it is almost exclusively the native half which is affected.

Although fresh, active cases of leprosy are still being found, the number is gradually diminishing in spite of the fact that there are now more well-informed doctors and nurses on the lookout for the disease. Furthermore, most of the new cases are of the Lepromatous type, which, we believe, indicates that the natives have less natural resistance to a disease which has become less prevalent. Therefore, we may conclude, with a degree of confidence short of certainty, that leprosy in the Kimberleys is on the decline.

The number of admissions to Derby Leprosarium may seem to contradict this optimistic view, but, if the crude admission figures are broken down into Active and old Inactive cases—and if we exclude those admitted for brief periods for the surgical correction of deformities—we have an entirely different picture.

	New Admissions		
	1964	1965	1966
Active Lepromatous Leprosy	5	8	7
Active Tuberculoid Leprosy	5	4	1
Non-Active Old Neural (Tuberculoid) Leprosy	1	2	4

Similarly, the number of patients in the Leprosarium, which has remained fairly constant at 180 for several years, gives no indication of the prevalence of active disease in the community. A significant proportion of the patients in Derby Leprosarium, and of new admissions, are old, non-infectious neural cases who, as they get older, can no longer cope with their disabilities and require institutional care. There is no institution for the aged in the Kimberleys, unless they have had leprosy.

In addition to the new admissions, there was a slightly larger number of re-admissions during the 1964-1966 period.

	Re-Admissions		
	1964	1965	1966
Active Lepromatous Leprosy	7	12	9
Active Tuberculoid Leprosy	3	2	2
Non-Active Old Neural Leprosy	....	5	3

During the three years 1964 to 1966, thirty new active cases were admitted to the Leprosarium and thirty-five which, after treatment and discharge from the Leprosarium, had relapsed into re-activity.

It may be of interest to give the year of discharge from the Leprosarium of the patients who were re-admitted.

Year of Discharge	Year of Re-Admission		
	1964	1965	1966
Before 1952	1	1	....
1953	1	2+1*	....
1954	....	1	2
1955	....	1	1
1956	1	1+1*	....
1957	1	2	1
1958	2	1*	1
1959	2	1	....
1960	....	1	....
1961	1	....	....
1962	....	2	1+1*
1963	1	2+1*	1
1964	....	1*	2+1*
1965	....	....	2
1966	....	....	1*

* The asterisk denotes an old neural case requiring nursing care or reparative surgery.

The number of relapses illustrates our need for a better drug, and, in the meantime, for longer treatment with the drugs we have.

D.D.S. (Avlosulfon) is still the principal drug used for routine treatment, but, since 1965, we have been giving much smaller dosage than we used to. As good a response is obtained from 100 mgms weekly as from the traditional 800 mgms, and there are fewer toxic effects. The sudden fall in haemoglobin, which was once fairly common, is now seldom seen. The smaller dosage is now recommended by the leading workers in this field.

Ciba 1906 (diphenylthiourea) continues to be our " secondline " drug, but it is now usually given simultaneously with D.D.S.

It is safe to say that every drug of proven value in the treatment of tuberculosis has, at some time, been tried, hopefully, for leprosy. However, it seemed that very little attention has been given to Ethionamide (Trescatyl). There is always the occasional leprosy patient who cannot tolerate D.D.S. and the reported low toxicity of Trescatyl was attractive. Accordingly, Trescatyl combined with Isonicotinic Acid Hydrazide was given initially to a smaller number (ten) of previously untreated patients with active lepromatous leprosy. After five years' experience with the drug, one can conclude that it has a useful subsidiary role in leprosy. The disease responded very favourably to Trescatyl without reactions or side-effects, but only for the first twelve months. Thereafter, the drug seemed to lose its effect, and treatment was continued with D.D.S.

B.C.G. vaccination has for long had its advocates as a protective measure for leprosy contacts. Critics have pointed out that it had never been used, for this purpose, on a large enough scale to assess its value. The first large-scale, controlled trial to find out how much protection, if any, given by B.C.G. against leprosy was started in Uganda in 1960. From the results so far published, it seems probable that B.C.G. does confer some protection against leprosy, therefore, the arrangements made by the Tuberculosis Control Branch in 1966 to offer B.C.G. vaccination to as many children as possible in the Kimberleys, as an anti-tuberculosis measure, could not have been more timely from the anti-leprosy point of view.

Sister Duggan, of the Tuberculosis Control Branch toured the Kimberleys in 1966, and gave B.C.G. to 1,671 children, mostly natives. It will be at least four years before we know whether this has given protection to any children exposed to close contact with leprosy.

Taking the long view, our resources can best be used in finding fresh cases and treating them before they can infect others. Nevertheless, we must also do something about the deformities, especially of the hands, which sometimes occur in long-standing cases. A well-balanced judgement is required in selecting cases so that hours of surgery are not spent in attempting to restore a hand to a state of perfection which its owner will never need. Since 1964, Dr. L J. Holman has performed tendon-grafting operations on an impressive number of partially paralysed hands and feet. As well as improving the function of limbs, there is good psychological effect on the patients. The possession of a surgically reconstructed hand has become a status symbol.

Physiotherapy, frequently as a pre and post-operative measure, was started in late 1964. Much assistance was given in the early days by physiotherapist Miss G. Harper and, for the past two years this form of treatment, as well as occupational therapy, has been the responsibility of Sister M. Dolorosa of the Order of St. John of God.

A portable x-ray unit was acquired for the Leprosarium in 1965, and has been used extensively in the assessment of cases suitable for reparative surgery.

Hookworm

Geographically, the distribution of hookworm infestation in the Kimberleys has not changed much since the last report. A native settlement has gradually evolved at Kununurra, and as might have been predicted, hookworm has been brought there by the families of native workers. A special study of hookworm in this area has been made by Dr. King and Dr. Hogan of Wyndham and, therefore, further comment is unnecessary here.

Suprisingly, the frequent movement of some native families from place to place within the Kimberleys has not broadcast the parasite as widely as expected. This must be attributed mainly to the anthelmintic treatment with Bephenium Hydroxynaphthoate (" Alcopar " B. W. & Co.) which has been given to all, or nearly all, natives in the affected localities.

The permanent solution of the hookworm problem lies only in better sanitation, education and hygiene training but, meanwhile, the mass administration of anthelmintic drugs is the only practical measure for control.

Posters illustrating the mode of spread of hookworm have been supplied by the Health Education Council. Their impact on ingrained native habits has not been dynamic. The subject of promiscuous defaecation does not lend itself to pictorial art.

On the other hand, a film depicting the hookworm's life history aroused great interest. For some time afterwards native audiences were prone to shout warnings about hookworm at any actor appearing on the screen without shoes.

At Forrest River Mission, Kalumburu Mission and Mowanjum Mission hookworm disease has been brought firmly under control by blanket treatment with " Alcopar " and improved sanitation.

Communal toilets for native settlements are, we hope and believe, on the way out. Natives are reluctant to use them and prefer to go elsewhere. Communal showers are also dangerous because the ground around them can be used as lavatories by small children.

At Kalumburu and Mowanjum, each family has been provided with its own lavatory. Thus it is possible to identify any family not maintaining the approved standard of hygiene, by inspecting the surrounding ground. The intention is to implant the idea that families who transgress in this way are not keeping up with the neighbours.

Since we have a safe, effective and cheap anthelmintic, it is merely academic and time-consuming to determine exactly the number of individuals in a community who are sometimes excreting hookworm ova. If it can be shown that an individual is infected, we have made a practice of treating the whole family and neighbouring families, and, if several families are infected, the whole community. It is quicker and cheaper,* in the long run, to do this because the collection of faecal samples from native children requires the patience of Job, and is open to deception. As with other commodities and services, if there is a market there is always a willing supplier.

It has been customary to give a second dose of Alcopar after one month in order to kill any hookworms which, at the time of the first dose, were still larvae on their way from the skin to the intestine.

Of course, the soil still being contaminated, the hookworm population of the intestine builds up again, and two or three courses of anthelmintic may be required in a year. Fortunately, there have been no reports of toxic effects from repeated monthly doses of " Alcopar ", nor have we encountered any.

As a second line of attack, Mr. Neville Corner of the Public Health Laboratory Service investigated the feasibility of interrupting the hookworm life cycle at the larval stage in the soil using a filtration method. Live hookworm larvae were regularly isolated from a container of contaminated soil for five months after adding the infected faeces. Care was taken to avoid confusion with nematodes of normal soil.

Various substances were tested for their effect on the larvae, some in the laboratory and some on contaminated ground at Mowanjum Mission. Sump oil, creosote, " Nemagon " (Shell Co.) and common salt were used on the actual ground. After the first two, the larvae seemed to be more actively motile. " Nemagon " was without effect, presumably because its mode of action requires the soil to be in good tilth. Salt was most effective.

The lethal effect of salt on the ova and larvae of Necator Americanus and Trichostrongyloides was described by Pokrovski (Moscow, 1966†) who suggested watering contaminated areas with sea water. On his advice, a village was flooded with water from the Caspian Sea, with interesting results. We have not tried this method.

However, we tried a method similar in principle and more easily controlled. Some of the most heavily contaminated spots at Mowanjum Mission, namely around the laundry and drinking-water taps, were covered by an evenly-spread layer of coarse salt, to a depth of about an inch. Water sprinklers were then turned on. We hoped that the larvae would be killed when they moved upwards from the deeper layers of the soil to the surface, in the normal course of their life cycle. Further samples of soil from this treated area contained no live larvae.

Obviously, the method has only a limited application. It could not be used generally in a camp, being unacceptable, and too expensive. For selected small areas, heavily contaminated and much frequented, salt should be considered.

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* A point in favour of " blanket " treatment is that a dose of anthelmintic costs less than laboratory examination of a specimen of faeces for hookworm ova. The examination costs $2.40, the dose of " Alcopar ", 55 cents.

† Pokrovski, S. N. Helminthological Abstracts, June, 1961.

Trachoma

" The problem (of trachoma control) is, at the present time, much simpler than in the past, as it has been discovered that the virus of trachoma is sensitive to most of the sulpha group of drugs when taken by mouth ". The quotation is from an admirable handbook on the subject published in 1958.*

Since 1958, the natives in the Kimberleys have taken a great deal of Sulpha drugs by mouth, and other treatment besides, but trachoma is still the most widespread eye affliction of the native half of the far-North population.

Obviously, we have under-estimated the complexity of the problem.

While the infection is relatively uncommon in the European children seen on stations and at school medical examinations in town, most native children show signs of trachoma infection and it is more likely to be active than healed, even if treated within the previous six months. The incidence of active infection at any particular time varies widely from station to station within the limits of 30 per cent. to 80 per cent.

At most missions, on the other hand, the picture is slightly more encouraging. Only 15 per cent. to 20 per cent. of children recently examined at Forrest River, Kalumburu and Balgo Hills had clinically active infections. Probably this reflects the better standard of housing on missions, compared with stations, and the effect of training in personal hygiene in lessening the risk of re-infection.

The poor results from our standard treatment with Achromycin eye drops may be partly due to the opportunities for re-infection created by environment and personal habits, but the impression is that the anti-biotic itself is not very effective, For example, a nursing sister of the Australian Inland Mission working around Fitzroy Crossing, personally gave the standard course, over a five month period, to the native children on four cattle stations. At the end of it, clinically active trachoma was about the same (40 per cent.) as before treatment, and no better than at a neighbouring station where no treatment whatever had recently been given.

Slightly better results were obtained at Balgo Hills Mission, where a fortnights' course of Sulphadimidine had been given as well at the beginning of the Achromycin treatment.

Others, using Achromycin alone elsewhere in the State, report much better results than ours. The casual agent in the South seems to respond better to the antibiotics than that of the clinically similar eye infection in the North. Therefore, it is more than likely that the way around the present impasse lies in further research into the pathology of " trachoma " and the characteristics of strains of the virus. A team, including an opthalmologist experienced in trachoma and a bacteriologist is expected to go North shortly to study the whole problem in the field.

Meanwhile, we can claim that our present treatment is not entirely useless. It clears up the bacterial infection frequently accompanying the trachoma, and that is well worth doing.

Cryptococcosis (*Torulosis*)

Three cases of cryptococcus neoformans meningitis occurred in the East Kimberley Division during 1965 and 1966.

Since 1957 the following seven proven cases of cryptococcosis have been diagnosed in that area—

Case No.	Name (initials)	Sex	Age	Race	Date Diagnosed	Area	Comment
1....	L. B.	F	25 years	P.A.	1957	Wyndham	Lobectomy for Cryptococcoma. R.P.H. 1957. Died 1964, near Beverley Springs, from unknown cause.
2....	C.	M	Unknown	F.B.	1958	Nicholson Station	Died at R.P.H. Autopsy " Torular meningitis ".
3....	F. D.	M	22 years	F.B.	1961	Turner River Station	Autopsy " Toruloma of lung and torular meningitis ".
4....	K. M.	F	23 years	F.B.	1961	Flora Valley	Cryptococcus neoformans in C.S.F. Autopsy " Torular meningitis ".
5....	L. B.	F	14 years	F.B.	1965	Halls Creek	Symptoms of meningitis. Suspected Cryptococcoma in X-ray (left lung). Cryptococcus neoformans in C.S.F. (direct, and on culture). No autopsy.
6....	H. O'R.	F	11 years	F.B.	1965	Wyndham	Cryptococcus neoformans in C.S.F. (direct smear and culture) Autopsy " Cryptococcal meningitis ".
7....	L. Y.	F	20 years	F.B.	1966	Gordon Downs Station	Cryptococcus neoformans in C.S.F. Autopsy " Cryptococcal meningitis, Cryptococcoma of lung ".

(F.B. Full-blood native. P.A. Part-aborigine.)

Except case No. 1, all these cases were treated at Derby by Dr. L. J. Holman. Case No. 6 was treated by Drs. E. King and I. H. Stewart, also.

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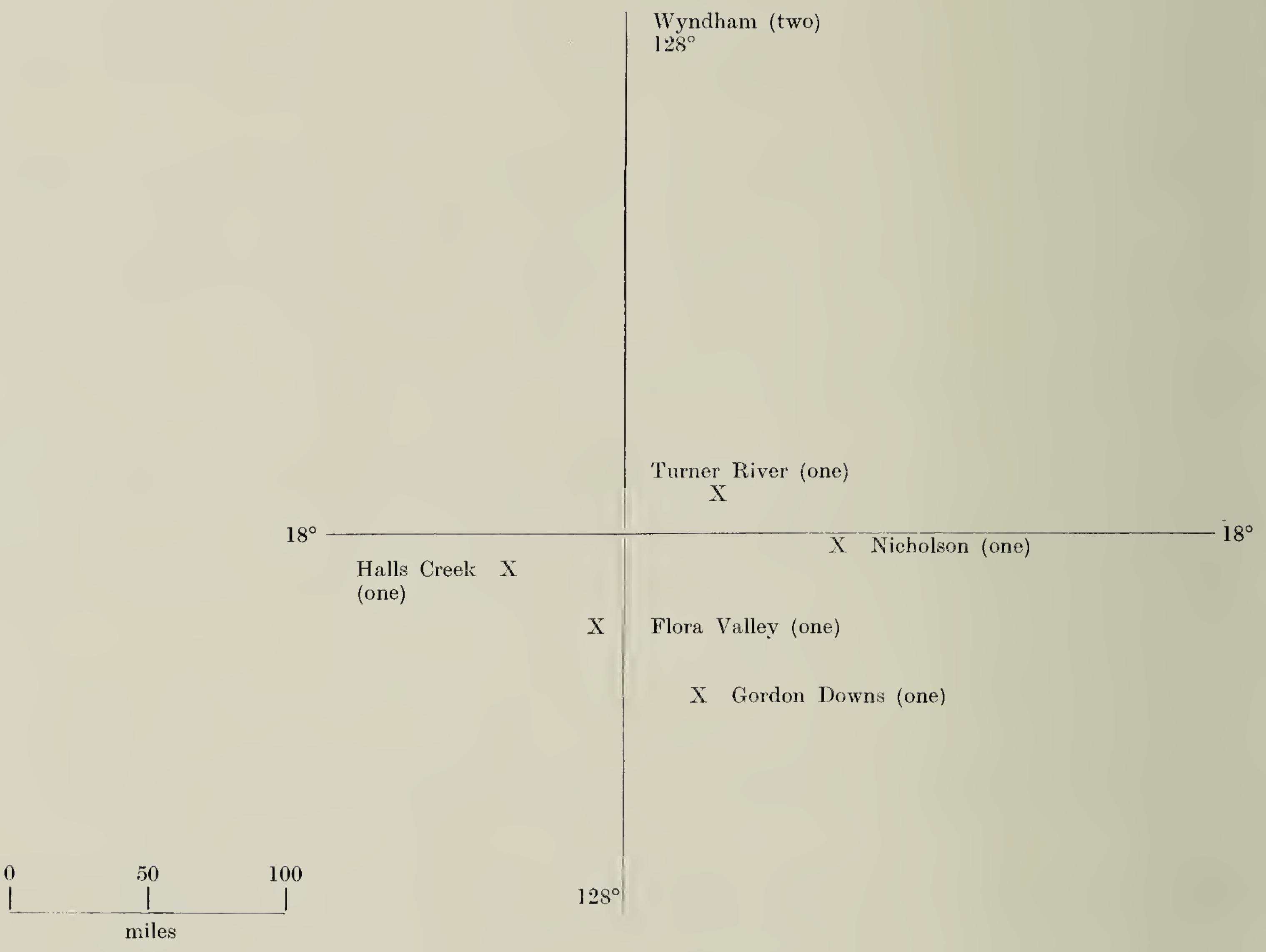
* " Trachoma in Australia " page IX of TRACHOMA MANUAL & ATLAS US PH Service, Public. 541, distributed in 1958 to DMO's of this Department.

Two of these cases came from Wyndham and the other five from within a radius of 60 miles of Flora Valley Station near Halls Creek. None came from the West Kimberley area. We know of no reason for this curious distribution.

The population of the Halls Creek, Flora Valley, Gordon Downs, Nicholson, Turner River area would not exceed 500 persons, of whom 384 are natives. On this basis, one fatal case of cryptococcal meningitis occurs per 1,000 persons per annum. According to EMMONS, C.W., about 35 fatal cases of cryptococcus neoformans infection are reported annually in the United States ; that is about one case per five million persons per annum. Therefore it does seem that the infection is commoner in the Flora Valley area than one would have expected.



Our figures may not give a full picture of the incidence of the disease. They represent (with the exception of Case 1) merely the number of meningeal infections which were diagnosed, usually at a late stage. The diagnosis is very difficult at an early stage when treatment might be effective. Possibly we are missing cases in which nervous system involvement is absent or minimal.

Case one and Case seven impressed one with the importance of routine chest radiography in early detection of cases which might be cryptococcosis. Case one was first detected by the Mass Radiography Unit and Case seven was x-rayed routinely because she was losing weight. Unfortunately, she was also showing personality changes by that time.

Amphotericin B. was given to Cases five, six and seven and proved entirely ineffective. Although diagnosis could not have been made earlier, nevertheless it was probably too late. Our most urgent need is for a serological test as an aid to early diagnosis.

It is a mystery why a few individuals should be susceptible to the ubiquitous cryptococcus and why, so far, only natives have been infected in this part of the country. Observations in the United States have shown that old pigeon droppings are a favoured culture medium for the cryptococcus neoformans (1, 2, 3). A different variety of pigeon, the Crested pigeon (Top-knot) is commonly found in, and around, native camping areas in the Kimberleys, and it is thought that the droppings of these birds maybe worth sampling and culture.

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1. Emmons, C. W. Am. J. Hyg. 1955.
2. Littman & Schneierson, Am, J. Hyg. 1959.
3. McDonough et al. " Public Health Reports " 1966, Vol. 81.

Appendix IVa

The Public Health Nurse in the Kimberleys

Nursing Sister P. McPherson

The 1966-67 ' wet ' season was one of the biggest on record, with more than double the West Kimberley annual rainfall and extensive widespread flooding. During this period of complete isolation, the babies in the Fitzroy Crossing area fared extremely well, with very little sickness reported and no major outbreaks in any of the camps.

On March 27 I was able to commence my work for the year although road conditions were hazardous. I had to cross the Fitzroy River by boat to get to " Go-Go " Station and, for many weeks, pushed through a back road in heavy sandhill country to reach Jubilee Downs. The Margaret River crossing was washed away so I was unable to cross to Fossil Downs to commence work until the first week in May.

During the year I have been able to work in the native camps for eight and a half months and have driven 13,168 miles.

My area of service is unchanged, with frequent regular visits to " Go-Go " and Brooking Springs stations, the United Aborigines Mission and the township of Fitzroy Crossing and Jubilee and Fossil Downs stations.

The original aim of cutting down the infant mortality rate and hospital admissions, by raising the standard of child care, has begun to be a reality which is both a surprise and a joy.

On going back through hospital records here, I find that six infants deaths occurred from this area between July, 1963, and July, 1964, and the following statistics concern children under the age of five years living on the stations I now visit—

July, 1964, to June, 1965	60 admissions to A.I.M., Fitzroy 13 evacuations to Derby Hospital 4 deaths
July, 1965, to June, 1966 (I commenced this work in May, 1966)	147 admissions to A.I.M., Fitzroy 26 evacuations to Derby Hospital 5 deaths
July, 1966, to June, 1967	87 admissions to A.I.M., Fitzroy 15 evacuations to Derby Hospital No infants deaths

(The only child death from this area occurred in August and will appear on next year's result.)

My programme of work was similar to last year, with Health Education, routine medical examinations, introduction and supervision of diet, minor treatments, palliative treatment of anaemia, trachoma treatment, immunizations, ante-natal checks and supervision of Mothercraft and Fathercraft for school-children.

Health Education

The programme was the same as that for last year, for all, and I concentrated more on mothers with new babies when these arrived.

Bathing, laundering clothes, introduction and surpervision of solids, water to drink, nets over the coolamons and ' walkabout ' bags all round ;

I had planned, at first, to quickly consolidate this that I had taught them all last year and then go on to bigger and better things but it took me the whole year to do so. This proved to be frustrating, mundane and dissatisfying as I had to constantly demonstrate, encourage and supervise this programme for a second year, and came to feel mentally, physically and spiritually depleted, with everything going out to these people and just nothing coming in. I also felt I had lost ground with the few, more alert, mothers when I could not come up with anything new and found I was holding them back by concentrating on the majority.

However, there have been a few new minor introductions to justify my existance.

On " Go-Go ", I sought out the woman who was responsible for lighting the fire under the hot water system in the camp ablution block and gradually organised her so that hot water was available each day for showers and laundry. Each mother was asked to bring one piece of wood from the station woodheap on her way back from the store in the morning and, eventually, it became routine and the more efficient ones began reporting the stragglers to me ! This wood carting eventually spread to the other women in the camp and they acquired a taste for the warm showers in the bitter cold of the Kimberley ' Dry ' season.

I also tried to create an awareness of the need for warm clothing for the children at this time. Most stations issue their natives with a cardigan or jumper when the " cold time " begins but this is not enough. I tried to get the mothers to save and buy the extras like singlets, windcheaters, pyjamas and overalls. This idea gained impetus at some places and I wrote to Perth for a supply by mail order. Others bought what they could locally and I asked the missionaries at the U.A.M. to order a supply for sale at their Mission store. On " Go-Go " I issued the children with warm clothes sent to me by Church Guilds from my home area in Eastern Victoria so most children were less miserable with the cold during the ' dry ' season.

On " Go-Go " Station, a piece of fruit is issued to all children daily if the loading has arrived from Perth. Mothers of the small babies usually ate this themselves but ceased doing so when they were shown just how ably their five-monthers could suck an orange or apple half. The babies looked delightful all lined up for supervised orange sucking each morning ! Fruit is not regularly available on any other place and there isn't any for sale at the Fitzroy store. In an attempt to overcome this, I started interesting the mothers in growing paw-paw.

We made a mixture of soil, ash and goat manure and planted the seed I had saved for them, and prepared trenches behind their huts to receive the young trees when they were ready to transplant during the ' wet ', I will not be able to see the results, if any, until I resume work in the camps when the roads open.

Housekeeping, introduced in September, proved to be an hilarious experience. The first step was to utilize what was available at camp level, which was nil, so the native mothers and I went bush in search of the Koonkaberry or the Verbena bush and made a " bushman's broom ". We then removed everything from the huts and swept them inside and out, aired the blankets and rolled the swags each day, found cartons and suitcases to store the clothing, and left doors and shutters open to air the huts. On " Go-Go ", the native mothers went one step better. Suddenly, great barbed wire fences were erected around the huts which made them look like the local " boob ". Some made stoves out of 44-gallon drums, which are very good, and others hung photographs of Slim Dusty on their walls. A few built tables out of old tin and steel standard posts. One woman built a table with legs six feet high—I cannot quite see its purpose although the pre-schoolers often sit underneath it in the shade.

Another mother regularly raided the top house garden and placed tins of flowers in her hut, then started threading individual blooms onto cotton and hung them like Christmas decorations across the ceiling—I was for ever being hit in the eye with an oleander when I entered !

Generally, though, the idea of keeping house is catching on and the fences, oleanders and pictures of Slim Dusty, although of no practical use, indicate the beginning of house pride. This is where it must all start if we expect to have a change of attitude and a lasting interest in living in a cleaner place.

The main development, health-education-wise, has been the introduction of postural drainage and percussion. " Cold-sick " still persists and often ends up as a broncho or lobar pneumonia. Originally, the old routine was hospital admission for observation in case it developed. Last year, the routine changed and I gave b.d. treatments of cough mixture, nose drops and ' Vicks ' rubs, and certainly cut down on admissions for observations but, this year, I have tired to cut down on the amount of medicine swallowed, inhaled or applied, by having the mothers tip their children over their knees and hit them on the back to make them cough and expectorate, so preventing the formation of a pneumonia. At first I was most unpopular with the mothers, who would snatch their children away and report to the Managers that " Sister Pat bin beltum my kid "! Now, it is more or less an automatic thing and, at the first sign of a cold, some mothers are beginning to do it without waiting for me to tell them and this is what I've been aiming at.

In another way I have been trying to get them to take a bit of responsibility for their own sores, boils, etc. Whereas, at one time I used to do the whole lot, they now wash the affected area and only present themselves to me at the Landrover for the actual dressing. I have also encouraged them to come into hospital showered and in clean clothes, with their children in a similar state, whenever I refer them for follow-up treatments. This makes a difference to the Outpatient routine of our A.I.M. Sisters here, because, at one time, most outpatients had to be put through the shower before the Sisters could treat them.

In an attempt to cut down the outpatient numbers, I now have most mothers at the stage of giving mixtures to their own babies whenever the Sisters prescribe it. They understand quite well and never seem to forget that t.d.s. mixtures are given " breakfast time, dinner time and supper time ", and q.i.d. mixtures likewise but with the extra dose at " chleep time ".

Now that the mothers are really keeping their children clean and nicely dressed, I never handle dirty children. I have started to get them to clean themselves up a bit as they look pretty horribly at times. This year I was given a hairdressing set and have started hair cutting in earnest and the women are beginning to look less like mops caught in a willy-willy. I am encouraging them to raise their hem-lines and they are looking quite a lot smarter but I am convinced that the mini-skirt will never really catch on !

This, then, is the extension of my original Health Education programme. Again, not a great contribution, but perhaps it can now be said that their standard of child care has been raised a fraction for all time.

Routine Medical Examinations

I have continued to check all babies and pre-schoolers when I first enter a camp and pick up the minor things before they develop. I still think this is the most important part of my work.

Medical Work

This has increased a lot during the year. The first month in the camps was extremely busy clearing the accumulation of the ' wet ' season mostly suppurating sores, abscesses, ulcerated legs and grass-seed infections. My figures for April show a total of 1,384 treatments and examinations. Discharging ears still continue to alarm me, especially when I see babies develop an Otitis Media at six weeks of age. I have tried various methods this year, regular swabbings for culture and sensitivity tests and treatment with the appropriate antibiotic, constant ear toilets, hospital admission and regular syringing. I have found that the only thing that will hold these infections is Chloromycetin eye ointment daily but, eventually, this is not enough and, when the Pyocyaneus or the Proteus infections settle there, the acute then becomes chronic and nothing will shift it.

The Derby Flying Doctor arranged for an Eye, Nose and Throat Specialist to come up from Perth to see these chronic cases. He left us with instructions for routine treatment but not much hope of stamping it out until it was ready to resolve itself anyway.

Gastro-enteritis—the long-time killer up here—can almost be said to be sporadic now and not endemic. There has only been one outbreak this year and, once more, it was the " white diarrhoea ". Probably of virus origin, this starts as a respiratory infection, characterised by a profuse nasal discharge, a loose cough, no chest or T.P.R. This is followed, about two days later, by some effortless vomiting and a couple of white curd and fluid bowel actions. At this stage, the children appear to be in good condition and the uninformed observer could be excused for not recognising the seriousness of the condition. With the next bowel action, the baby usually collapses and the only hope they have then is to be flown to Derby immediately. Therefore, it is imperative to pick up these children at the very onset to observe the development.

An epidemic broke out in August and, as soon as I picked up the first case on " Go-Go ", I cancelled my routine work and patrolled all the camps each day, picking up admissions, alerting the mothers on what to look for and to ask the Managers to bring them in immediately their children started vomiting ; then, purposely, I created a mild panic with the Managers and station people so that transport to hospital was made available day or night.

The A.I.M. Sisters here re-organised their hospital, and set up a reception area outside, where I deposited my load after each trip before returning to the camps looking for more. The Sisters worked day and night and the R.F.D.S. plane flew many times to take these children to those who could do more for them than we could. The only infant death in my area in two years occurred as a result of this epidemic.

Chest infections are still the most prevalent illness and nothing seems to prevent it although I am hoping the postural drainage and percussion will help prevent the formation of a pneumonia.

Anaemia

This was, again, very marked at the start of the year except on the stations further out where they had to wait many weeks for the roads to open to get in their stores. The natives lived almost entirely on beef and had high haemoglobins as a result.

The mothers, again, gave their children " Ciron " mixture each day and the range was between 75 per cent. and 24 per cent. H.b. at the end of the year.

Trachoma

At the start of the year, the entire native population in my area was examined and found to be approximately 50 per cent. positive. At the completion of the five month course of treatment, they were approximately 24 per cent. positive.

The previous year showed 100 per cent. positive before, and 50 per cent. positive after treatment.

A similar pattern of results has again emerged—

Adults	Almost all negative
School-children	About 25 per cent. positive
Pre-Schoolers	100 per cent. positive before and after treatment.

The pre-school children at the United Aboriginal Mission had a 25 per cent. drop after treatment but they had a good diet in the dining room most of the year and this certainly helped.

A number of white people in the township and at the U.A.M. had trachoma and still do. This created a mild panic.

I started training a young native girl at " Go-Go " station, and one at Brooking Springs, to help me with the eye drops and hope to continue with this idea this year. I am still convinced that personal hygiene and good diet are, perhaps, of greater value than the " Achromycin " eye drops but these must be kept up to clear the eyes of secondary infection. The old natives say the drops relieve the irritation of dust and, probably, conjunctivitis and they are usually first in the line up for " hidrops ".

Immunizations

All the pre-school children, and older babies, have now been covered and I have only to start the course on new babies as they are born.

I will be introducing Sabin oral polio vaccine, after the " wet ", to all people in my area—adults and whites included.

During the year, two tetanus cases were admitted to our Fitzroy Hospital so I started a course of Tetanus Toxoid for adults and managed to give 374 people their first two needles. I took this opportunity of checking up on the white community re-boosters and was surprised to find a large number of people had not bothered at all to have immunization previously so they, too, have now been covered.

In October, I started giving B.C.G. vaccinations as part of an anti-leprosy campaign and have vaccinated eighty-one babies and pre-school children. This follows up a mass B.C.G. vaccination campaign started by the T.B. Control Board the previous year and, now, all children from school age down have been covered.

Ante-Natal Checks

These have been continued this year again and the women are now expecting to come to hospital for delivery and are beginning to like the idea of it. Of the 23 new babies born to the mothers in my area this year, three were born in the " bush " during the big " wet " season floods, when we could not get them into town, but we are hoping that the days of childbirth in a creek bed are over for them all.

To Sum Up

Nineteen sixty seven has been a frustrating year. Despite this, there have been two big break-throughs. The itinerant Public Health Nurse is now an accepted part of the Kimberley scene and some of the native mothers have now realised why I am here and why I work with their children. This gives me tremendous satisfaction.

I have come to realise more fully that, unless all of us here, working for the benefit of the natives, start working together as a team, we will achieve nothing. I realise, also, that the natives will have to be provided with more facilities and accoutrements for better hygiene. At present, my maximum efforts bring only minimum results because all I am doing is teaching the natives to survive at a substandard level.

Attitudes and conditions must change, for no longer can employers be indifferent to their natives and to their seemingly dull, drab existence for this is not so. The aboriginal has a place and a position within his group, knows joy and sorrow, is educated, works, and is entertained. He walks, sometimes, close to mystery and to forces greater than nature, has beliefs, traditions and a way of life that serves him physically and, at present, satisfies him mentally—but for how long will this be so ?

Appendix V

Child Health Services

R. Edmonds, Senior Medical Officer

HEALTH CENTRES

No increase occurred in the number of centres in 1966, but re-distribution of work was made in some areas. The number of main centres, each staffed by one full time Sister who usually visits one or more sub-centres, remains at 72. There was therefore, no significant increase in staff. New buildings, replacing either old ones or temporary quarters occurred at Rossmoyne, Lathlain, North Perth, Cunderdin and Derby.

The year was a bad one for staff shortages, and some figures from centres closed down at the end of the year are omitted from the total figures in the table below. However, this table shows a substantial increase over 1965.

Table 1

	1966	1965	1964
Birth notifications received	14,904	13,853	14,934
Births registered	17,007	16,186	16,685
Gross attendances	240,401	231,191	243,530
Individual attendances	34,194	31,812	32,662
Home visits	27,312	26,482	27,131
Telephone consultations	12,089	11,833	10,149
Hospital visits	15,860	N.R.	N.R.

(This excludes Mingenew and Manjimup whose figures were not available owing to closure for part of the year 1966)

There was, during 1966, some breakdown in the system of birth notifications. This, due to clerical staff shortages and alterations, reduced both the number of notifications but, more importantly, caused late notification. This reduced significantly the number of initial visits to mothers in their homes. A figure not previously reported in these statistics is that of hospital visiting of mothers of new born babies in hospital. As this is often the first contact with a mother it is an important part of the service. Of 17,007 births recorded in the state, 15,860 were seen in maternity hospitals, which is a reasonably good proportion, considering both the generally short length of stay in hospital and the fact that by no means all maternity units in the state are within easy reach of a manned Infant Health Centre.

It will be noted that all figures are higher than those of 1965. Over one third of the individual attendances are over the age of one year.

CORRESPONDENCE

Ten sisters and four typists are employed in what is rather loosely described as the Correspondence Section. The major part of their work is divided into two.

(1) Correspondence with mothers of young children in areas of Western Australia where they are out of reach of regular visiting by infant health sisters and

(2) What is virtually a Health Education course for children in distant schools.

Both of these sections are highly personal in their relationships between clients (mothers and school children) and the sisters who deal with them.

As well as their correspondence with these people, most of the sisters undertake various trips into their areas during the year to make personal contacts with the people with whom they are dealing ; mothers, " weigh agents ", pupils, school teachers, Native Welfare personnel, missioners and many others. They also man the four trips per annum on the " Tea and Sugar Train " between Kalgoorlie and Port Augusta.

Although the above activities cover a large portion of the year's work, there are many others which are encroaching more and more into the duties. One of the most time consuming is coping with visitors who range from the occasional international traveller who, passing through, attempts to find out something of the activities of the service, through students of all types (Nursing, Medical, Dietitian and others) school teachers and infant health trainees, to mass visits by groups of children visiting Perth from distant areas for holidays and school camps. The correspondence sisters spend a great deal of their time in coping with these visitors who, although sometimes very trying, do represent a public to whom it is beleived the service has something to give.

Two clinics are also run in the building by the Correspondence Section, one transferred from the old Headquarters in Hay Street known as West Perth Infant Health Centre, and one for country mothers who call. They also man an expanded clinic at the Native Settlement at Allawah Grove, Guilford, and a rather fundamental clinic at East Perth, chiefly concerned with natives in that slum area. These two are dealt with in the section on native children.

The other duties carried out by the correspondence staff are numerous but more occasional, but a mention should be made of their function in the preparation of leaflets, both new and revisions of old ones. Considerable time and effort is spent in the preparation and delivery of broadcast talks and occasional television appearances. In general they are acting as a Public Relations Officer for the division. When sudden emergencies arise in the metropolitan area, sickness etc., the headquarter's staff undertake some of the relieving duties. At least two sisters at any one time will be attending classes of one type or another and most of them belong to organisations such as the Public Health Association. This section is by no means underworked.

CORRESPONDENCE SECTION

Table 2

	1966	1965
Letters in	22,431	20,658
Letters out	19,216	18,355
Lessons	20,449	18,172
Trips (2 sisters)	....	13
Pupils doing Correspondence—		
Girls	986	832
Boys	352	287
Adults	13	....
	1,351	1,119
Lecture and demonstration	144	53
Audiences (individuals)	3,542	1,664

Table 2 is a summary of some of the figures provided by this section. The figures for the previous year are put there for comparison. It will be seen that, in all activities, there has been a significant increase in numbers, as was anticipated in last year's report. The physical facilities, space etc., have improved since moving into the new building and this is reflected in the volume of the work of the correspondence section. There is still far too much clerical work being done by the sisters and relief (by additions to the typing staff) would enable them to concentrate on the professional aspects of the work.

MOTHERCRAFT AND PARENTCRAFT

Five full time Sisters were engaged in this section until 1965 and the number was reduced to three in 1966. This was anticipating reduction if teaching in secondary schools which was terminated, as far as the State Schools were concerned, at the end of 1966. The total of pupils taught, including country and metropolitan was 886 as against 2,371 in 1965.

As reported last year replacing the mothercraft teaching in schools, the " Parentcraft " classes were increased These well attended classes are for young parents (genarally those expecting their first child). During 1966 the classes were held, as before in the headquarters building and in Fremantle. This year some expansion took place in the outer suburban centres and a start was made in country centres also. The virtual cessation of school classes in 1967 should see a further increase in the " Parentcraft " field.

PRE-SCHOOL HEALTH

There still remains an unfortunate division between the attacks on the subject of pre-school health. Each year a few more sisters undergo the intensive ten weeks' course in this subject and there is a steady increase in the number in the field doing pre-school work.

It is estimated that a single visit by a pre-school child takes about the same time as seeing four to five " under one " babies. The increase in numbers (Table 3) since 1962, indicates a respectable increase in the amount of work done with pre-school children.

Table 3

NUMBER OF CHILDREN OVER THE AGE OF ONE YEAR ATTENDING INFANT HEALTH CENTRES 1962–1966

	1–2	Over 2	Total
1962	6,021	4,250	10,271
1963	6,261	4,990	11,251
1964	6,856	5,172	12,028
1965	6,247	4,901	11,148
1966	6,968	5,873	12,841

The shift of emphasis from concern over the physical to concern over the emotional and developmental aspects of child health in an increasingly affluent community is reflected in these attendances.

The next section of pre-school health care, the " Pre-School Health Scheme ", was described in some detail in the 1965 report. The survey of 1965 was reflected in 1966 (Table 4) and it appears that we continue to have about the same failure rate as in 1964.

Table 4

	1966	1965
Number joining and sent to family doctor	8,674 (51%)	8,851 (53%)
Cards returned to Centres	7,958 (92%)	7,636 (86.5%)
Number due for one year check	6,945	6,444
Seen by sister and sent to family doctor	4,278 (61.5%)	3,629 (50%)
Cards returned to Centres	3,242 (76%)	3,122 (86%)
Number due for 5th year check	1,141	N.A.
Seen by sister—sent to doctor	371 (32.5%)	N.A.
Cards returned to Centre	259 (70%)	N.A.

Figures in bracket indicate percentage " success."

Just over half the children born in the state join the scheme in the first instance. This table shows a few trends, which though not conclusive, indicate that review is required. The year 1966 is the first year in which there has been a significant number of children registered as being due for the fifth year check. Less than one third responded to the reminder from the Sister, and of this small number sent to the doctor, only seventy per cent had their cards returned. Failure to go to the doctor with a card is probably the commonest cause of this, but some cards are not in fact returned by the doctors although the children have been seen. Failure to respond to the sister's reminder letter can be attributed to a number of causes. A small percentage have moved out of the district and are no longer accessible at the previous mailing address. Others have had their children to the doctor during the preceding years, and cannot see the point of further attendance. Some are unwilling to make the effort or to spend the money. Still others have had their children examined specifically, for example, at kindergarten, and cannot see the point of further examination. As can be seen below, this kindergarten group covers a considerable percentage of the 4–6 age group, over 5,000 children. Some sort of rationalisation of the Pre-School Health Scheme is required but so far the mechanism has not been evolved.

The third pre-school division is that under the pre-school Medical Officer with her Nurse Assistant, who examine children in kindergartens. Numbers are still rising but with the present facilities no more can be coped with so further increases are not expected until more staff is available or different arrangements are made.

KINDERGARTEN PRE-SCHOOL CENTRES

Table 5

	1964	1965	1966
Total	4,416	5,031	5,392
Metropolitan	3,063	3,301	3,839
Country	1,355	1,730	1,553

The Pre-School Medical Officer, Dr. Ethel Roberts, reports a reduction in the number requiring dental attention. The need for dental attention most often occurred where dentists were not readily available. A surprisingly large number of children are found not to be properly immunised in this generally considered favoured community, 72 not immunised against Diptheria and 49 not immunised against Poliomyelitis. She also reports that there is an increase in the number of children attending the centres. Southern Cross, Kalgoorlie, Norseman and Esperance were not visited in 1966. Doctor Roberts concludes her report as follows—

> " A new combined kindergarten and Infant Health Centre will be opened at Embleton. It is hoped to further the close association between the two branches of child care.
>
> The Fremantle Child Minding Centre is to be opened in 1967. Much thought has been given to this centre and as this type of child care will probably increase in the future, it will be interesting to watch the development of this centre.
>
> It is becoming increasingly difficult to visit each centre once a year. Two chief difficulties are the centres are open only at specific times and it is difficult to make arrangements for examinations at other times and the second difficulty is the scattered nature of the centres throughout the state and the distance to be travelled between centres, particularly when one has to be at a certain centre on a particular day at a particular time. It appears that, under the present arrangement, the limit has been almost reached as to the number one team can examine."

VITAL STATISTICS

Over the past five years there has been a decrease both in the number of births and in the birth rate. However, as will be seen from Table 6, this fall has, at least temporarily, been halted and in 1966 there was a small increase in the total number of births and a small rise in the birth rate.

Table 6

Year	Total Births	Birth Rate
1958	16,623	25.08
1963	17,290	22.36
1964	16,685	21.11
1965	16,186	20.08
1966	17,007	20.33

It remains to be seen whether this rise will continue.

It was stated last year in this report that the infant mortality rate for the State of W.A. had not altered greatly over the past ten years.

The mean Infant Mortality rate for the ten years 1956-1965 was 21.58 (164,911 Births and 3,560 Deaths under one year).

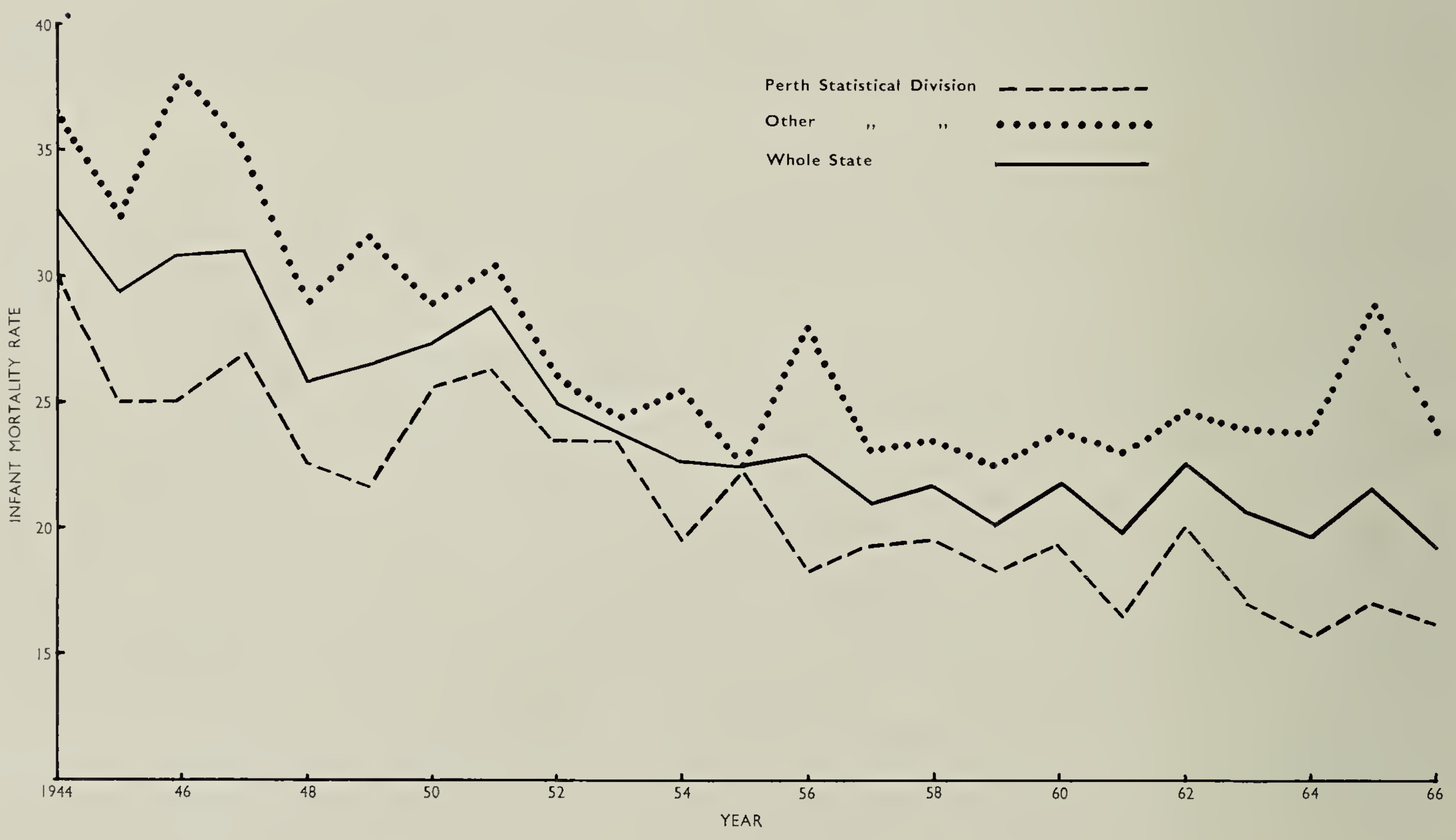
In 1966 the infant mortality rate for the State fell to 19.03. This fall significantly improved the ten year figure. The mean rate for the ten year period 1957-1966 was 20.74. (169,002 Births and 3,505 Infant deaths).

Since the publication of the 1965 report there has been an alteration in the classification of Statistical Divisions. The Metropolitan Statistical Division has been increased in area by the addition of the Swan Statistical Division and the name changed to Perth Statistical Division. This change has produced some difference in the relative rates between the two major divisions, but has not, of course, altered the whole State figures.

Figure one shows, graphically the Infant Mortality rates from 1944 to 1966, for the whole State, the Perth Statistical Division and Other Statistical Divisions.

Fig. 1

Infant Mortality Rates – Western Australia 1944-1966



It will be noted that the difference between country and city persists. Distances and the consequent dilution of diagnostic and curative services undoubtedly play their part in causing the higher country rate. But there are many people of aboriginal extraction living in country areas under what can only be described as slum conditions, and these conditions almost certainly contribute their share to the mortality. The significance of this needs definition and it is proposed, during the next year or two, to elicit information about all deaths under the age of five years to see exactly what proportions of the population in the two racial groups, white and part-native, are contibuting to these figures.

As has been mentioned before, the deaths from the one to four year groups are just as important, perhaps even more so in regard to the natives, as those under one year, because it is in the post neo-natal period and in the one to four groups where the environmental conditions become more significant in morbidity and mortality. Table 7 shows the deaths in the one to four year group over the past five years (1962-1966).

Table 7

DEATHS 1–4 YEARS

	Perth Statistical Division	Other Statistical Division	Whole State
1962	23	44	67
1963	26	58	84
1964	33	47	80
1965	21	35	56
1966	27	43	70

These are not converted to rates, but when this was done for 1952-56, 1959-67 the rates for the other statistical divisions in this age group approached twice that of the metropolitan division. The figures in Table seven, despite a fall in the total, leave no room for complacency.

Again it must be emphasised that the population of this state is so small that annual fluctuations in rates are likely to be considerable, and caution must continue to be exercised in interpreting annual figures. But when these annual figures show the same trends over five or more years it seems likely that these trends are significant.

HEALTH OF NATIVE CHILDREN

Two additional attempts to do something for these people were started in 1966. A clinic in the South—West Anglicans Mission's Centre and shop in East Perth, has been running there all this year and contact has been made with a great many of the slum dwellers in this area. Co-operation has been sought and achieved with the Perth City Council. This area, which is a bad slum and which could well become worse, is being closely watched as far as this is possible with our limited resources.

An A.I.M. Sister was installed at Fitzroy Crossing and with the co-operation of the Australian Inland Mission and the local Medical staff in Derby has been working since March, in a very limited area.

This policy was adopted as a pilot trial, rather than trying to spread the effort too widely. While the nearby Stations and Missions are accessible by road, (during all of the dry and some of the wet season) the sister has almost daily contacts with the mothers and children in these areas. It is too early to be at all definite about the effects of health education and the early recognition of illness which this sister undertakes, but the figures supplied to date seem to indicate that the effect of her work has exceeded expectations. Another year may serve to confirm or deny this impression.

Further extension, wherever possible, has taken place in the other country areas in the State but the effects of health education and training of native mothers in bringing up their children can only be minimal as long as these people stay on such a low financial, economic and social level. Furthermore, in the opinion of the writer, the presence of increasing numbers of these people with poor standards of hygiene pose a potential threat to the rest of the population.

Industrial expansion into areas where there are more native and part-natives will increase this threat to health.

As mentioned above attempts will be made in the next year to define the significance of ill health in the part-native and native population.

INDUSTRIAL EXPANSION

Little progress has been made over the past twelve months in the handling of child health in these areas but serious consideration is being given to expansion, the most urgent being in Port Hedland and district. Soon it is expected that expansion in the new nickel mining fields in the Kalgoorlie area will require more attention. Points made in the report for 1965 remain valid and these are re-iterated for ease of reference.

" It is realised that rapidly expanding townships, particularly in hot areas, represent a potential danger to child health unless the principles and practice of preventive medicine learnt in W.A. during this century are applied during development. It is felt that the majority of the population who are going to these areas have been brought up in reasonably healthy conditions and their socio-economic position is favourable to healthy living. Therefore, the order of priority to achieve this should be—

(1) Maintenance of rigid standards of water supply, housing, sewage disposal, food handling etc. In other words, maintenance of the ordinary public health practices which are applied in developed areas. Particularly strict control of temporary accommodation such as caravan parks, camps etc., will be required to maintain conditions suitable for young children.

(2) Provision of adequate medical facilities, including easy access to diagnostic and curative services as well as the overall supervision of the environment by public health medical personnel and

(3) As the concentrations of population increase, the provision of special health services for children—infant, pre-school and school health.

It is pointed out that the special infant and child health services are placed third in this priority. However, if the two first items, namely public health and medical services are inadequate, the necessity for special services is probably greater."

SURVEYS

The following investigations into certian aspects of child health were undertaken.

Diets of Pre-School Children

The dietitian attached to the Public Health Department, Mrs, S. Langelaan, organised and, with assistance from others, carried out a survey on the diets of 244 kindergarten children around the metropolitan area. The survey, which will be published in full elsewhere, had various objectives. Some of the more significant findings were :—twenty-two children were overweight (nine per cent.) in that they were over the 90th percentile on the standards generally accepted in Australia, and eleven (4·5 per cent.) were underweight in that they were under the 10th percentile. This finding was confirmed by examining the weights of kindergarten children not included in the dietary survey, where the same proportion was found, twice the number above the 90th percentile as those below the 10th. However, the actual percentage above the 90th was that theoretically expected, i.e. 90 per cent.

As to nutrients, the three that could be considered as presenting significant deficieneies were ascorbic acid, thiamine and iron. The significance of iron is dubious but to check this an investigation of haemoglobin levels will be undertaken. It seems likely, however, that the Australian dietary allowances, which were used as a standard, are probably higher than necessary.

The thiamine deficiency is also of doubtful significance, but seemed fairly consistent and may well be worth further investigation. The ascorbic acid deficiency may have been due to the time of year—April and May—when summer fruits had just about finished and before the citrus friuts were in full season and, again, it would not be outside the bounds of possibility that the allowances are rather generous.

It was interesting to note that, in this survey of children of presumably reasonably well off people, only 37.5 per cent. were regularly taking flouride tablets. This finding confirms the necessity for replacing flouride in water supplies which lack this compound.

Breast Feeding

The incidence of breast feeding and its duration in the State of Western Australia was not known. In particular it was doubtful whether the rate was rising or falling. Preliminary investigation done in 1965 suggested, in fact, that the rates were rising slightly and that they compared favourably with the other states in Australia. However, because this investigation may well have been biased, in 1966 a carefully planned investigation was carried out. Its objects were to discover whether or not breast feeding was increasing, decreasing or remaining stationary in this State. A carefully controlled random selection of babies born in 1960 and in 1964 were made, all of whom had attended for at least six months. While not necessarily representing a true picture of the whole community, the two groups were strictly comparable. Table eight shows the main results.

Table 8

DURATION OF LACTATION

	Children born in 1960	Children born in 1964
Number in groups	1,414	1,453
Average duration of lactation (days)	97	75
Number *never* breast fed	249 (17.5%)	358 (24.6%)

In the five years there was a very significant drop in the mean length of lactation, from 97 to 75 days, and the number who never breast fed rose from 17.5 per cent. in 1960 to 24.6 per cent. in 1964.

Evidence is accumulating that the disadvantages of artificial feeding have been somewhat minimised in the recent past and attempts should be made, more vigorously than hitherto, to halt this declining incidence and duration of breast feeding. A more vigorous campaign by the sisters among all sections of the community, it is believed, is justifiable.

Child Health in the Kimberleys

For four weeks in January and February and then later in March for ten days, the Senior Medical Officer visited the Kimberleys, in order to get some idea of the type of investigation which might be undertaken in this area to determine some facts about morbidity and mortality among native children. He would like first of all to express his very sincere thanks to the local medical and nursing staff for the courtesy and assistance afforded him, and also to the Director and staff of the Public Health Department Laboratories who assisted in the investigations.

The impressions gained on this survey are numerous and serve to reinforce the statements made after a visit there in 1964.

Bacteriological investigations confirm that salmonella and shigella organisms are endemic in this area and it seems possible that a majority of the population are relatively immune to the types isolated. Stools from patients in hospital and from people who were not in any way unwell, showed approximately equal isolations during this survey. Shigella were more prominent in patients and salmonella more commonly found in survey cases, but the differences were not significant, A most unexpected absence of S. Typhimurium (reputed to be the most ubiquitous of the salmonella) was discovered. Although searched for, no pathogenic E. Coli were isolated. An unsuspected possible vector of salmonella was found to be reptiles *e.g.* lizards and snakes, but strangely enough no evidence was found to suggest that flies were carrying either salmonellae or shigellae. The apparent relative immunity of breast fed babies to these organisms prompts a suggestion that an investigation in this area into the antibody content of mother's milk and their effectiveness, may be of considerable significance, not only there, but elsewhere.

Local medical officers are of the opinion that anaemia of doubtful aetiology is a significant cause of mortality when epidemic infections occur in this area. This anaemia is well worth investigation particularly its relationship with nutrition and with hookworm infestation. Previous dietary surveys have shown that ascorbic acid is likely, during certain times of the year, to be deficient in the community and although frank scurvy is apparently unknown, there is some evidence (sufficient at least to justify further investigation) that sub-clinical deficiency might be quite common.

Another field of potential interest and significance is that of auditory defects in children in this area where, as with all Australian natives who come into close contact with the western way of life, the incidence of otitis media, re-current and prolonged, is very common. A few were screened, very inadequately, during this survey and indicated that there was at least some conductive hearing loss.

The biggest problem, however, is that of re-current diarrhoea and the chronic undernutrition associated with this. Surveys have shown a considerable reduction in weight gain after the first six months of life among full blood native children particularly in the Northern Territory. Examination of growth curves under investigation at the moment in this State seem to show similar falling off of these rates and the matter of nutrition and re-current infection is one which needs extensive investigation.

STAFF

Three sisters retired in 1966. Sister Darby of Victoria Park, Sister Strudwick of Collie and Sister Boylson of Leederville. They had all been with the service for some years.

There were eight resignations. Four of the sisters left to work in hospitals, two to go to other states, one left to marry and one resigned due to ill health.

Seven new sisters joined the service ; five of them had recently completed the training course at Ngala, one came from Victoria and one was a married Ngala graduate who returned to part-time work. Five were on long service leave. Six sisters completed the pre-school course, and twenty-four did a week's refresher in pre-school work. One sister completed a Technical Education Course and another the Health Education Course.

At the end of the year there were 86 full-time sisters on the staff and six part-time. Five ex-staff returned to duty during the year to fill temporary gaps.

Sister Woolcott, Assistant Staff Supervisor, completed her nursing education course in Melbourne, for which she was subsidized by a Heinz Scholarship.

The Senior Medical Officer was on sick leave for part of the year. He would like to express his gratitude for the way in which the staff carried on during this absence.

CONCLUSION

The adequacy of a health service which charges fees can, to some degree, be measured by the response of the public. But the response and usage of a service which makes no charge to the actual users, measures only the public's opinion of the service. This is particularly true of Infant Health Services.

In any part of the world where this service exists, the response is high. While giving due value to the wants of the community as expressed by usage of the service, in order to avoid complacency it is essential that the individuals in the service should consider certain questions. First (and most important) does the service fill the *needs* of the public as well as its *wants* ? Does it keep abreast of modern technical developments within its field ? Does it maintain a continuous relationship with the changing needs of a developing and numerically increasing community ? Finally, does it maintain a proper relationship with the practical and financial resources of the State ? Failure to keep these questions in mind and to provide answers as adequate as possible, will result in a reduction of the effectiveness of the service. Changes in the Western Australian child health services are probably both desirable and inevitable.

While making changes in a well established service, it is important to build upon existing practice and not abandon satisfactory methods until such time as they can be replaced by better ones. Of equal importance, expansion in any field of the service must not be undertaken until there is a reasonable assurance of the new service being maintained.

Changes which could be envisaged within the near future are—

(i) A merging of the available resources for the care of the infant, pre-school and school child Because school children are a relatively captive group, it is much easier to search for and deal fairly comprehensively with physical, intellectual and emotional defects in the school child than at any other period of life. Nevertheless, greater emphasis should probably be placed upon the earlier recognition of these difficulties, for two reasons. First, successful treatment is more likely if defects are discovered early and secondly, emotional disturbances are less likely to occur with earlier recognition and treatment.

Secondly, with the increasing efficacy of life-saving treatment in early infancy, we can confidently anticipate a continuing rise in the population of handicapped children, and a corresponding increase in the demand for special schools, training centres etc., for them.

The Infant and Pre-School Health Service already maintains a close liaison with the Education Department Special Services Branch, the Child Guidance Clinic and the Mental Health Department for mentally defective children, but a closer liaison between these organisations and the Schools Medical Service is probably desirable.

(ii) Whatever may be the decision about the Schools Medical Service in country towns, both examination and follow up will, to a large extent, depend on the availability of adequate nursing services. It is manifestly impossible, with the present allocation of infant health sisters, to undertake the responsibility of country schools examinations at all effectively without seriously curtailing their other work which, rightly or wrongly, they consider of the first importance. Districts in which these sisters work would have to be reduced in size for effective school work to be carried out and this would involve an increase in the number of sisters in country posts. The practicability of this increase is in some doubt, because recruitment of nurses for country areas, particularly the smaller towns, is difficult. It is understood that posts for trained nurses in country hosptials, for example, are often filled on a rather short term basis. This can be entirely satisfactory where there is a reasonably set routine which varies little from hospital to hospital. With the nurse doing preventive work, however, because so much of her effectiveness depends upon a rather intimate relationship with the families with whom she deals, long term appointments are considered highly desirable. Two years in any one area is considered a minimum period.

(iii) Finally there is the very large problem of effective health education work with the depressed natives and part-natives in the community. Until the social, educational and economic standards of these people improve, any health education work, to be effective, will have to be concentrated into small areas. Experience suggests that sisters should be restricted to seeing a few people frequently. Until there are enough sisters (or other trained workers) to maintain this intimate contact with small groups, we must not abandon our rather tenuous but still real contact with these people by the Correspondence Service, as well as increasing our contact with them by country and metropolitan sisters. Even if potentially effective steps were taken immediately to improve the social and economic position of the natives, it seems likely that it will be many years before the need for skilled health workers among them is reduced.

It is suggested, in regard to the natives, that every effort should be made to recruit from among the high school population of native girls candidates for full nursing training, with the hope that some of these may eventually become health nurses to work among their own people. It is possible, as an interim measure, that something less than full professional training could be organised for young native girls to act as health workers in the more distant areas where the native population would benefit from their specialised training in preventive work. In both these fields, professional and sub-professional, recruitment for training would probably have to be considerably in excess of the required output, but it is suggested that consideration should be given to the possible implementation of some such scheme.

Appendix VI

School Medical Service

Many country schools are now up to date on a two year inspection schedule and all have been examined within three years.

A total number of 56,877 children were examined of whom 15,489 were in the country. The parents of 14,299 were notified of some or other including dental defects, 4,386 were referred for medical attention. Table II shows a good response by the parents in obtaining this medical attention.

A total number of 68,610 children were examined for pediculosis (Table III) and the number notified as infected were 438. Re-visit to ensure that effective treatment had been carried out brought the total number of heads inspected up to 109,976.

The general health and nutrition of the children remains good.

Table I

School Medical Service

EXAMINATION OF METROPOLITAN AND COUNTRY SCHOOLS, 1966

—	Number Examined	Number Notified	Number Referred for Medical Attention	Number Referred for Home Attention and Observation	Number Requiring Dental Attention	Skin Complaints		Nutrition			Eyes Medical Attention	Tonsils Medical Attention
						Number	Per cent.	3	Under 3	Over 3		
Metropolitan Schools												
Boys	21,595	5,757	1,785	1,481	2,962	....	....	20,336	396	863	....	....
Girls	19,793	4,984	1,604	1,067	2,658	....	....	18,284	275	1,234	....	....
Total	41,388	10,741	3,389	2,548	5,620	1,080	38·3	38,620	671	2,097	1,589	88
Country Schools												
Boys	7,749	1,776	486	817	772	....	....	7,461	115	173	....	....
Girls	7,740	1,782	514	459	750	....	....	7,377	99	264	....	....
Total	15,489	3,558	1,000	1,276	1,522	369	41·9	14,838	214	437	745	21
State Total												
Boys	29,344	7,533	2,271	2,298	3,734	....	....	27,797	511	1,036	....	....
Girls	27,533	6,766	2,118	1,526	3,408	....	....	25,661	374	1,498	....	....
Total	56,877	14,299	4,389	3,824	7,142	1,449	39·3	53,458	885	2,534	2,325	109

Table II

HOME VISITS BY SCHOOL NURSES

Total Visits *re* Medical Attention	Received Attention	Promised Attention	Disinterested	Out or Left District	Visit to Cases Referred for Home Attention	Parents Phoned or Called at Office
4,828	2,361	1,237	89	1,035	314	422

Table III

HYGIENE INSPECTIONS BY NURSES FOR PEDICULOSIS

	No. of Children Examined	Number Notified	Percentage
Metropolitan	54,368	276	·50
Country	14,242	162	1·12
Total	68,610	438	0·63

Including re-visits to above a total number of 109,976 heads were examined or re-examined.

Appendix VII

School Dental Service

E. J. Turnbull, Senior Dental Officer

Following is my report for the year ending 31st December, 1966

STAFF

We commenced the year with three vacancies in our establishment of fifteen.

During the period under review there was one retirement, while four new appointments were made.

We therefore finished the year with a full staff although two were on extended leave, one being overseas to further his studies.

GENERAL

With the opening of new dental clinics at Wyndham and Broome this year we now have five in the North and North West and these provide a service for the entire population.

The Dental Officers staffing these made visits to a number of missions and outstation clinics.

To cope with the ever increasing demand for our services in the Pilbarra district an itinerant Dental Officer was sent North and visited Onslow, Dampier, Roebourne and the inland towns and missions. The trip helped considerably to relieve the pressure of work on the Port Hedland Clinic.

With five and on occasions six of our staff working in the North treating children and adults, the number of schools visited in the southern part of the State was somewhat curtailed.

FIGURES FOR THE SCHOOL DENTAL SERVICE

Number of country schools visited	87
Number of metropolitan schools visited	4
Number of native missions visited	15
Number of orphanages and institutions visited	12
Number of children examined	9,247
Number of children treated	5,256
Number of children needing no treatment	3,340
Number of children who were to receive treatment by private dentists	98
Number of children whose parents ignored notices	553

Details of Treatment Given

Fillings	10,454
Extractions	6,072
Silver nitrate treatments	274
Prophylaxis	1,157
X-rays	10
Other conservative treatments	795
Orthodontic appliances and dentures	41

NORTH WEST

The following work was done for the general population (apart from children) by an itinerant Dental Officer and those in charge of the Clinics at Carnarvon, Port Hedland, Broome, Derby and Wyndham.

Natives

Number attended free of charge	1,014
Fillings	532
Extractions	811
Dentures	19
Denture repairs	5
Prophylaxis	127
Other treatments	100

Number of White Free List Patients (*Pensioners, Missionaries, etc.*)	391
Fillings	487
Extractions	190
Dentures	31
Denture rebases	10
Denture repairs	46
Prophylaxis	84
Other treatments	169

Number of paying patients	3,014
Fillings	2,468
Extractions	1,827
Dentures	206
Denture rebases	38
Denture repairs	156
Prophylaxis	275
Other treatments	631
Fees debited	$26,619.59

Opportunity was taken to have the Mobile Clinics of the Perth Dental Hospital treat school children on behalf of the School Dental Service at places they visited.

Details

Number of school children examined	4,848
Fillings	5,604
Extractions	1,178
Miscellaneous	707

Reimbursement for the cost of this treatment was made to the Perth Dental Hospital and amounted to $22,081.00.

Appendix VIII

Nursing Section – Operation

By Miss P. F. Lee, Principal Matron

Hospitals Inspected

"C" Class	150
"A" Class	45
Country Hospitals	64

Numerous inspections made of properties being considered for conversion to "C" Class requirements, and for extension of present licensed beds.

New "C" Class Hospitals Registered in 1966

Mount Saint Camillus, Forrestfield—8 beds
Southern Cross Hospital, Brentwood—21 beds

Scholarships Awarded for Post-Graduate Study at the College of Nursing, Australia, 1966

Miss E. J. McMahon	Nursing Administration
Miss E. Betags	Nursing Education (Midwifery)
Miss L. M. White	Hospital Nursing and Ward Management

Miss E. J. McMahon has been appointed Deputy Matron, Regional Hospital, Geraldton.
Miss E. Betags has returned to the Tutorial Staff of King Edward Memorial Hospital.
Miss L. M. White has returned to Royal Perth Hospital staff.

This year a short Pilot Course in Nursing Administrative Procedures was held at the College of Nursing, Australia, from 16th May to 10th June, 1966. This was attended by—

Mrs M. C. Kenneally, Deputy Matron, Mount Henry Hospital
Mr M. Jeisman, Nursing Supervisor, Hawthorn Hospital

Emergency Nursing Service

This Service was arranged to provide experienced double certificated sisters to Departmental and Country Board Hospitals where acute shortages exist. Eighteen sisters appointed in 1966. It is anticipated that 24 sisters would ultimately be recruited to this Service.

Nursing Bursaries

The number of bursaries granted during 1966 : 83

GOVERNMENT SCHOOL OF NURSING

Report submitted by Organiser of Nurse Training, Miss E. E. Harler.

Staff

Principal Tutor	Miss V. A. M. Hobbs, Diploma of Nursing Education, F.C.N.A.
Sister Tutor	Mrs D. Campin, Diploma of Nursing Education, F.C.N.A.
Sister Tutor	Miss P. Smart—6½ hours daily
Home Sister and Housekeeper	Mrs E. Turner

The School has functioned satisfactorily, but not to capacity. The problems of acute clinical experience have not been resolved.

The second year students, during 1966, were given the opportunity to observe a casualty department at Royal Perth Hospital.

Once again the School is indebted to numerous institutions for making available opportunities to observe and attend bedside clinics and theatre experience. These institutions are Repatriation General Hospital, Royal Perth Hospital, and the Shenton Park Annexe.

AFFILIATED HOSPITALS

Regional Hospital, Kalgoorlie

Tutor	Mr T. W. Carran, Diploma of Nursing Education
Clinical Supervisor	Sister C. D. Ace

The building recently acquired as a school has given the teaching staff better opportunity to demonstrate and lecture to the students.

District Hospital, Northam

Tutor .... Mr H. E. Harris, Diploma of Nursing Education—resigned November, 1966

Student's studies for the remainder of 1966 were supervised by Matron and Deputy Matron.

Regional Hospital, Geraldton

Sister Tutor .... Miss M. Underwood, Diploma of Nursing Education

Since the occupancy of the Regional Hospital, the clinical experience has not increased at this centre.

Repatriation General Hospital

Four Preliminary Training Schools were held in 1966 and each school observed for 28 hours at the Repatriation General Hospital

Second year nurses from Northam and Geraldton Hospitals attended Repatriation General Hospital for two weeks theatre experience. Students during this period reside at Sir Charles Gairdner Hospital.

RECRUITMENT—1966

Evening visits to High Schools for Career Nights—11 in Metropolitan Area.

Numerous other visits to country High Schools were made when country hospitals were visited.

Recruitment could be further developed with the support of visual material.

REFRESHER WEEKS FOR GENERAL HOSPITAL NURSE EDUCATORS AND SCHOOL STAFF—5th TO 9th SEPTEMBER, 1966

Discussions ranged over practical procedures and the content of lectures, plus programmes of training. With the inclusion of visits, was beneficial to all concerned.

Attended

Sister V. A. M. Hobbs, Sister D. Campin, Sister M. Underwood, Sister P. Smart, Mr T. Carran, Mr H. E. Harris.

Miss N. G. A. Tant served as Home Sister and Housekeeper to the School from 31st July, 1950 to 10th January, 1966. Throughout this time Miss Tant gave loyal and faithfull service.

NURSING AIDE TRAINING HOSPITALS

Miss P. Lodge, Health Visitor Tutor Certificate, London, appointed 12th April, 1966, as Supervisor, Nursing Aide Training.

Mount Henry Hospital, Como

Nursing Aide Instructors .... Mrs E. Downie
Mrs V. Rodereda

Thirty trainee nursing aides are maintained at this centre for six months of the course.

District Hospital, Merredin

Nursing Aide Instructor .... Sister Marston, resigned 15th April, 1966.

Sister P. M. Harrison appointed 11th May, 1966, after one month indoctrination at Mount Henry Hospital.

District Hospital, Busselton

Nursing Aide Instructor .... Sister P. Peacock

District Hospital, Collie

Nursing Aide Instructor .... Mrs D. Hamill

District Hospital, Katanning

Nursing Aide Instructor .... Miss L. Harrison

District Hospital, Narrogin

Nursing Aide Instructor .... Miss P. Constable

It is difficult to maintain the number of Nursing Aides required for this centre.

Regional Hospital, Albany

Nursing Aide Instructor .... Mrs J. Grocock, Mrs McKail, appointed 8th August, 1966. One month's indoctrination course was completed at Mount Henry Hospital.

Regional Hospital, Bunbury

Nursing Aide Instructor .... Mrs V. J. Prosser

Swan Districts Hospital

Nursing Aide Instructor .... Miss M. J. Caldwell, resigned 20th October, 1966, after nine years of loyal, interested and conscientious service.

To the end of 1966, duties carried out by temporary Sister.

Sunset Home

Nursing Instructor .... Mrs A. G. Findlay

Duties—Teaching practical nursing to nursing orderlies and nursing assistants.

REFRESHER WEEK FOR NON-PRACTISING TRAINED NURSES WISHING TO RETURN TO ACTIVE NURSING

Courses conducted by College of Nursing, Australia, W.A. State Committee.

Facilities and staff made available by the Hon. the Minister for Helath.

These courses were conducted as follows—

27th June, 1966—1st July, 1966	20 attended
19th September, 1966—23rd September, 1966	13 attended

Miss E. Harler—Visits to General and Nursing Aide Training Hospitals, 1966

Kalgoorlie	1
Northam	2
Geraldton	1
Albany	3
Bunbury	1
Busselton	1
Katanning	3
Mount Henry Hospital	4
Narrogin	2
Swan Districts	3
Collie	1
Sunset Home	1
Merredin	1

Miss P. Lodge—Visits to Country Nursing Aide Schools

Merredin	2
Busselton	1
Katanning	1
Albany	2
Collie	1
Narrogin	1
Bunbury	1
Swan Districts	3
Sunset	1

DETAILS OF GENERAL TRAINEES FROM GOVERNMENT SCHOOL OF NURSING, 1966

Hospital	Commenced 1966	Completed Training 1966	Resigned 1966	Terminated	Total Remaining 31/12/66
Kalgoorlie	16	12	2	1 (exam)	50
Northam	13	7	3	....	34
Geraldton	16	9	3	3	27
From other training schools	6	5	2	....	5
P.T.S. not transferred	6	....	1	....	....
Total	57	33	11	4	116

(Number transferred from P.T.S. to Nursing Aide Course—5)

DETAILS OF NURSING AIDE TRAINING—1966

Hospital	Commenced 1966	Completed Training	Terminated	Resigned	No. of Pre-clinical Schools
Mount Henry	72	....	2	6	4
Merredin	14	17	....	2	....
Bunbury	28	22	2	4	....
Busselton	16	12	....	....	....
Collie	15	21	1	1	....
Katanning	15	16	1	2	....
Narrogin	19	17	1	3	....
Albany	30	11	1	8	1
Swan Districts	7	11	....	3	....
Total	216	127	8	29	5

Appendix IX

Nurses' Registration Board of Western Australia

Commissioner of Public Health

The following submission is a report on the activities of the Nurses' Registration Board for the year ended 31st December, 1966.

1. *Composition of the Board*

Dr. W. S. Davidson	Commissioner of Public Health—*ex officio* member.
Miss P. F. Lee	Principal Matron, Public Health Department—*ex officio* member.
Dr. A. S. Ellis	Director of Mental Health Services—*ex officio* member.
Dr. L. E. Le Souef	Medical Practitioner—Nominated by the Australian Medical Association.
Dr. R. Nattrass	Practising Obstetrician—Nominated by the Australian Medical Association.
Mr J. Williams, (1st January, 1966—25th May, 1966)	Specialist in General Education—Nominated by the Minister for Education.
Mr W. Howse, (26th May, 1966—31st December, 1966)	Specialist in General Education—Nominated by the Minister for Education.
Miss K. M. Johnson	General Nurse—Nominated by the Minister for Health.
Miss G. T. Sibert	Midwifery and Infant Health Nurse—Nominated by the Minister for Health.
Mrs M. Green	Mental Health and General Nurse—Nominated by the Minister for Health.
Mr J. K. Brett	Tutor—Nominated by the Minister for Health.
Miss O. E. Anstey	Elected by the General Nurses (1st April, 1966)—General Nurse.
Mr R. Quinn	Mental Nurse—Elected by the Registered Mental Health Nurses. (16th June, 1966)
Miss D. Tredrea	Midwifery Nurse—Elected by Midwifery Nurses. (16th June, 1966)

2. *Officers of the Board*

Miss D. H. Bailey	Education Officer, Public Health Department.
Mrs P. Lambert	Assistant Education Officer, Public Health Department.
Mr R. O. Dee	Nursing Officer, Public Health Department.
Mr T. Gibson	Acting Secretary—1st January, 1966—1st June, 1966.
Mr L. H. Pilgrim	Secretary—June, 1966 to November, 1966.

3. *Meetings*

During the year, the following meetings were held:—

Board Meetings (General)	11
Board Meetings (Special)	2
Education Committee	15
Working Committee	11
Sub-Committee Reveiwing Act and Regulations	1
Curriculum Builders Committee	12
Examiners' Meetings	50

4. *Registrations*

4.1 *Initial Registrations*

The following table sets out the number of initial registrations/enrolments accepted during the year. 1965 figures are also shown for comparison purposes.

Division of Register	Number of Registrations Accepted					
	Qualified by examination in W.A.		Qualified outside of W.A.		Totals	
	1965	1966	1965	1966	1965	1966
General	333	281	309	506	642	787
Children's Nurse	....	....	3	5	3	5
Mental Health Nurse	22	13	4	20	26	33
Midwifery Nurse	103	102	147	241	250	343
Mothercraft	19	19	4	7	23	26
Dental Nurse	20	14	....	....	20	14
Infant Health Nurse	15	16	12	22	27	38
Nursing Aide (Enrolments)	213	117	26	49	239	166
Totals	725	562	505	850	1,230	1,412

Of the 506 external registrations (General) accepted by the Board, 266 applicants trained in the Eastern States of Australia 189 from England, Scotland and Wales ; 19 from New Zealand ; 10 trained in Holland ; 5 trained in India ; 4 in South Africa ; 4 from Ireland ; 3 each from U.S.A. and Germany ; and 1 each from France, Denmark and Malaysia.

The Aide recruitment has increased by approximately 50, but the enrolled numbers appear less due to the following regulation:—

> " On and after the 1st day of January, 1966, a person who is qualified for enrolment as a nursing aide, pursuant to sub-regulation (1) of this regulation, shall not be so enrolled unless and until she has, after becoming so qualified, undertaken and completed a period of supervised experience for not less than six months at an approved institution and has received and lodged with the Board, a report in respect of her service and conduct at that institution, that is satisfactory to the Board."

Currently Registered (*Figures as at* 30/6/67)—

General	5,281
General and Midwifery	2,345
General, Midwifery, Infant Health	404
General and Mental Health	35
Mental Health Only	269
Nursing Aides	1,150
Midwifery Only	22
Dental	62
Mothercraft	82
Tuberculosis	114
Sick Children's	33

Currently Employed (*Medical Department Figures as at* 30/6/67)—
(Taken from all W.A. Registered Hospitals, and areas where nurses are employed, exluding Doctor's Surgeries.)

General	1,461
General and Midwifery	863
General, Midwifery, Infant Health	287
Mothercraft	36
General and Mental Health	35
Midwifery Only	21
Nursing Aides	546

4.2 *Removals and Restorations*

The following table sets out the numbers of those persons whose names have been removed from, or restored to, the divisions of the Register, as required under Sections 11 (1) and 11 (3) of the Act, (Non-payment of annual re-registration fees.)

1965 figures are also shown for comparison purposes.

Division of Register	Number Removed		Number Restored		Affect on Register 1966	
	1965	1966	1965	1966	Gain	Loss
General	457	463	325	270	....	193
Children's Nurse	....	3	....	2	....	1
Mental Health Nurse	21	30	13	18	....	12
Midwifery Nurse	187	219	95	80	....	139
Mothercraft Nurse	18	17	1	....	....	17
Dental Nurse	....	5	....	....	....	5
Infant Health Nurse	11	19	18	14	....	5
Nursing Aides	120	111	16	40	....	71
Tuberculosis Nurse	27	15	4	3	....	12
Totals	841	882	472	427	....	455

5. *Examinations*

The Board conducted 22 sets of examinations, involving 817 candidates, as set out in the following table. The number of examiners used to conduct these examinations totalled 149.

Title	No. of exams	Number Candidates 1st Attempt			Number Resits		
		Total	Pass	Fail	Total	Pass	Fail
General	2	315	251	64	62	53	9
Mental Health (Final Exam)	2	11	8	3	3	3	
Mental Health (First Year)	2	24	20	4	8	5	3
Midwifery	2	103	102	1	....	....	....
Mothercraft	3	19	19	....	....	....	....
Dental	2	19	18	1	....	....	....
Infant Health	3	15	14	1	1	1	....
Nursing Aides	3	234	229	5	3	3	....
Totals	19	740	661	79	77	65	12

In addition to the above examinations, the Schools of Nursing conducted First Year Professional Assessment Examinations for a further 522 General Nursing Candidates. The Nurses' Registration Board gave overall supervision and issued certificates to those who were successful in passing the First Year Professional Assessment.

5.2 *Students Nurses' Intake and Wastage* 1965–1966

COMPARISON OF INTAKE AND WASTAGE WITH BASIC EDUCATIONAL STANDARDS

	Educational Standards of Students									
	Leaving Certificate		Failed Leaving		4th Year Pass		Junior Certificate		3rd Year Pass	
	1965	1966	1965	1966	1965	1966	1965	1966	1965	1966
Intake—										
Total students : 485 in 1965 .... 530 in 1966	156	141	116	155	64	79	136	145	13	10
Wastage—										
Total students : 126 in 1965 .... 161 in 1966	35	49	19	20	8	18	59	72	5	2
Reason for Wastage—										
Theory weak	2	4	2	4	....	4	12	11	1	....
Failure to Adjust	14	18	4	5	2	6	14	12	....	....
Marriage	6	9	3	4	....	3	14	20	1	....
Health	....	4	1	1	2	....	3	4	....	....
Dismissed	....	4	1	....	....	1	1	5	2	....
Trans. to N/A	4	....	5	2	2	3	12	9	1	1
Trans. to Other Hospitals	....	....	1	....	....	....	1	3	....	....
All other reasons	9	10	2	4	2	1	2	8	....	1
Stage of Withdrawal—										
Pre. 1st Year Assess.	14	28	4	9	4	9	20	33	3	....
Fail 1st Year Assess.	5	3	5	1	2	....	11	4	1	1
2nd Year	10	13	9	9	2	8	22	31	1	....
3rd Year	6	5	1	1	....	1	6	4	....	1

6. *Outlines of Other Business*

6.1 Nomination of the following Board members as delegates and observers for the Interstate Conference on Nursing Education.

Conference Chairman	Dr. W. S. Davidson
Delegates	Miss D. H. Bailey Mr J. G. Williams
Observers	Dr. D. D. Letham Miss P. F. Lee

6.2 Forming of a Sub-Committee to review the Nurses' Registration Act and Regulations, comprising the following members:—

Mr. L. E. Le Souef (Convenor)
Miss D. H. Bailey
Miss O. E. Anstey
Mr J. K. Brett
Miss R. Broadway—Executive Secretary, R.A.N.F.
Miss M. Leworthy—President, Royal Australian Nursing Federation.

6.3 Three Springs and Esperance Hospitals were added to the list of Hospitals meeting the criteria for six months supervised practice of Nursing Aides.

6.4 Appointment of the following members to represent the Board on a committee to be formed by the Minister for Health to examine proposals to establish a Para-Medical College—
Miss D. H. Bailey ; Miss O. E. Anstey ; Dr. D. D. Letham.

6.5 Amendments to the Nurses' Registration Board Regulations, Inclusion of clauses to cover "Dangerous Errors" where, in the opinion of the examining panel, a candidate's apparent doubtful ability in practical nursing is assumed likely to cause "Dangerous Errors".

6.6 Establishment of a Nurse Education Advisory Committee by the Technical Education Division, including nominated representatives of the Board—
Miss O. E. Anstey ; Miss K. M. Johnson.

6.7 Approval was given for the Clinical Schools for Nursing Aides to be conducted in Regional Hospitals and Mount Henry Home by the Board, as this was agreed this would assist Nursing Aide training as conducted by the Medical Department.

6.8 Amendments to the Nurses' Registration Board Regulations. Inclusion of clauses covering the addition of a science subject as a compulsory educational requirement, for entry to Schools of Nursing training courses, as from January, 1968.

6.9 Inclusion of regulations enabling Mental Health trainees, who have completed 1st year and passed the required examination, to be allowed to enrol as a Nursing Aide, following completion of a further six months' training in a nursing aide school and passing of the nursing aide enrolment examination.

Appendix X

Division of Occupational Health

D. D. Letham, Physican in Charge

THE PNEUMOCONIOSES

(MINING INDUSTRY)

Medical Examination

Under the provisions of the Mine Workers' Relief Act, the Mines Medical Officer examined 3,941 miners. Of these, 508 were suffering from silicosis (26 new cases), four from silico-tuberculosis, 19 from asbestosis (four new cases), and four from tuberculosis only. A total of 2,908 applicants were examined for appointment or re-appointment.

Pneumoconiosis Medical Board

This Board, of which Dr. J. C. McNulty, Physician, Occupational Health, is a member, met monthly at Perth and in Kalgoorlie.

A total of 365 applicants for compensation were examined ; of these, 281 were found to be suffering from pneumoconiosis.

Mining for Iron Ore

While it is not always easy to determine whether a worker is a miner within the meaning of the Mines Regulation and Mine Workers' Relief Acts, all men employed in the handling of iron ore, from mine to ship loading, should have initial and periodical medical examinations.

Australian Blue Asbestos Mine—Wittenoom

Mr G. Major, Physicist, of the Commonwealth School of Public Health and Tropical Medicine, at the request of this department, made an extensive survey of dust conditions in the mine and mill. He completed the survey in mid-Novermber ; results will not be available until next year.

The mine closed on 30th December. At this time, 90 men were known to have develpoed pneumoconiosis, frequently a mixture of silicosis and asbestosis. It is asbestosis which has made the significant contribution to morbidity and mortality.

Of these 90 men, there were 30 who had had previous exposure to pneumoconiotic dusts. Of the remaining 60, 41 had worked in the mill and 19 were underground miners. There is no doubt that, over the past years of the company's operations, the mill made the greatest contribution to morbidity and mortality. Of the total of 90 men, 12 have died primarily as a result of asbestosis. Almost all the survivors are disabled—some severely. Many of these men are under 40, and there are even a few under 30 years of age.

OTHER DUSTY OCCUPATIONS

A total of 316 17 in. x 14 in. and 3,916 70 mm. chest x-rays were taken of workers in other dusty trades. There were no new cases of silicosis.

Detailed recommendations were made to the Factories Branch of the Department of Labour on sand-blasting and these have been incorporated in comprehensive Abrasive Blasting Regulations, to be administered by that department.

NOISE

(HEARING CONSERVATION PROGRAMME)

Goldfields

By the end of this year, a total of 890 miners had been examined. The chart below shows the distribution of hearing loss, in decibels, in these miners—

Hearing Loss	Underground Miners	Surface Miners	Total
Normal or Slight	94	87	181
Significant	82	51	133
Moderate	34	21	55
Severe	281	111	392
Very Severe	43	15	58
Totals	534	285	819

The definition of degrees of hearing loss is as follows—

Normal or slight	25 db loss or less at 4,000 cycles only.
Significant	25–40 db loss at 4,000 cycles only.
Moderate	45 db loss or more at 4,000 cycles only.
Severe	45db loss or more at 4,000 cycles. 25 db loss or more at 1,000 cycles.
Very Severe	45 db loss or more at 4,000 cycles. 45 db loss or more at 1,000 cycles.

The percentage analysis of those severely and very severely affected is as follows—

	Underground	Surface	Total
All Miners	61%	44%	55%
Those mining for ten years or more	73%	59%	69%

From these percentages, it appears that—

(1) The hearing loss in underground miners is considerably greater than that in surface miners.

(2) Miners who have been working for more than ten years are more likely to experience severe or more severe hearing loss than those who have been working less than that time.

(3) Nearly three-quarters of underground miners who have been working for more than ten years have severe or very severe hearing loss.

In interpreting these figures, two factors which could modify them need to be taken into account. Firstly, the miners were volunteers ; so that it is probable that those aware of some degree of hearing loss would be more likely to come than those not so aware. This would have the effect of giving a significant bias towards a higher figure in the severe and very severe groups. Secondly, there is, from year to year due to advancing age, a small but steady loss of hearing (presbycusis) which will have made a small contribution to the figures for those with more than ten years' mining.

Metropolitan Area

Sixty-five follow-up visits were made to factories which have a Hearing Conservation Programme. As well, 15 visits were made in company with the Sound Engineer from the Commonwealth Acoustic Laboratory, checking noise levels and investigating complaints in factories not previously visited. In all, 134 audiograms were done and ear protection provided for 121 employees.

Survey on Hearing of School Boys

Towards the end of the year a prospective survey of school boys was commenced at a public school for boys. The purpose of the survey is to assess hearing loss in school boys from year to year and to ascertain if the loss is noise-caused. This year, 166 boys were examined. A number of cases of hearing loss, mostly slight and probably related to exposure to noise, were detected.

When one or two cohorts of boys have been followed through the school for three or four years, it is expected that correlation of noise-caused hearing loss in these school boys with cause will be possible.

Ramsett Guns

Two men using Ramsett Guns developed severe hearing loss, associated with tinnitus. As the noise levels from these guns can be as high as 115 db, close-fitting ear muffs are necessary for protection against noise.

DERMATITIS

There were 42 notifications of occupational dermatitis. Forty-four visits to factories were made. Dermatitis has not involved any particular industry but is spread widely, usually involving isolated employees.

PESTICIDES AND FUMIGANTS

Use and Supervision

During the year, twenty ships were fumigated at Fremantle.

The work was carried out by pest control firms using methyl bromide. Operators were supervised by the Health Inspector (Occupational Health) and a Certificate of Clearance issued to allow the crew to return and workmen to board.

Special Legislation

Due to the number of ships involved and the dangers involved in the handling of large quantities of toxic fumigants, legislation was introduced on 31st May to amend the Pesticide Regulations. These new regulations provide for the registration of commercial fumigating firms using cyanide compounds and methyl bromide ; and for the licensing of operators. Five firms were registered and 25 men licensed. Of the men licensed, a number were from companies such as flour mills that do their own fumigation work but do not do it commercially.

Manufacturers, formulators and packers of pesticides were visited and, where indicated, employees were subjected to tests and atmospheric concentrations of pesticides carried out.

Visits were made to a number of nurseries to check on the use of pesticides (including fumigants) and to make recommendations on protective measures where necessary.

Protective Equipment

Due to the wide range of pesticides in current use and the large number of people handling them, the use of appropriate protective equipment by operators was watched throughout the year. Maintenance and care of this equipment still remains disappointing and requires constant attention to attain tolerable standards.

GASES AND VAPOURS

Carbon Tetrachloride

A draftsman using carbon tetrachloride to clean grease and finger marks from a model developed acute renal disease. Ventilation and the general handling of solvents in his working area were unsatisfactory and it had to be assumed that there was a causal relationship between renal disease and carbon tetrachloride. However, the progress of the disease, and further investigations, have cast some doubt on this association.

Government departments using carbon tetrachloride have been surveyed and through the Government Safety Committee the Heads of Departments circularized that wherever possible safer substitutes for carbon tetrachloride should be used. The use of carbon tetrachloride extinguishers in hospitals has been discontinued.

Isocyanates

In the manufacture of polyurethane foam, the use of toluene diisocyanate (T.D.I.) has been almost completely discontinued and the much safer substitute di-isocyanato-diphenyl methane (M.D.I.) is now used ; or T.D.I. is used in a pre-polymer state. However, a number of men spraying M.D.I. suffered isocyanate poisoning and required hospitalization because the respiratory protection provided was inadequate to protect against particulate spray.

During a disastrous fire, which destroyed a number of sheds lined with polyurethane foam, fire fighters suffered isocyanate poisoning with severe bronchospasm which persisted for several days.

Only positive-pressure air-supplied hoods provide adequate protection whilst spraying isocyanates.

Others

In January, three men developed an acute respiratory illness, after cleaning out a condenser at an electric power station. No cause was found and the incidence was attributed to coincidence. Subsequently, three other workers, similarly engaged, developed acute respiratory illness. No cause was found but the next cleaning of the condenser was supervised and workers wore protective clothing and air-supplied positive-pressure hoods. There has been no further touble.

COMPRESSED AIR FOR BREATHING

Increasing amounts of compressed air are being used in industry, particularly in spray-painting, sand-blasting and maintenance work in enclosed spaces.

Ten units were inspected, with a view to improving the quality of the air breathed. The main contaminants were found to be dust and oil fumes, caused by ill-fitting hoods and inadequate filters in the air lines.

A number of small firms supply compressed air " refills " to SCUBA divers and samples of such air were tested for carbon monoxide and oil content and found to comply with the Australian Standard Code Z26–1965. Units in five firms were inspected.

New hookah units made for private sale, as well as Government use, were inspected and tested for carbon monoxide at the air outlet point. Five firms were visited. It was evident that more attention was being paid to the design of these units than had been noted previously.

METALS

Lead

Eighty-eight men handling lead had urine tests during the year. There were no cases of lead poisoning in industry.

A Council road worker developed lead poisoning which was certified as due to the nature of his employment but, on investigation, his whole family was found to be suffering from lead poisoning which was traced to home-made wine. The source of the lead was never traced but a number of the wine flagons which were used had been salvaged from a Council dump and may have been contaminated with lead.

Arsenic

Four pest control operators handling arsenic were examined and urine arsenic levels estimated with negative results.

In a firm re-packing arsenical pesticides into smaller containers, a number of employees developed moderately severe burns of hands and wrists because inadequate protection had been provided.

VIBRATION DISEASE

Subsequent to the diagnosis of severe Raynaud's Phenomenon in a tree feller using chain saws, a number of forestry workers were examined. In one area, five forestry workers complained of Raynaud's Phenomenon in both hands but further examinations in other areas failed to produce any other cases. It would appear that vibration disease in the users of chain saws occurs sporadically and this may be due to local climatic and working conditions. A number of cases has occurred among underground machine miners at Australian Blue Asbestos (Wittenoom) and although it was not considered to occur in the gold-mining industry specific enquiry of machine miners shows that it does occur and may be much commoner than expected.

SPRAINS AND STRAINS

Sprains and strains in industry account for 30 per cent. or more of all accidents. Examination of compensation records revealed that these figures also applied to departmental hospitals. Many of these are back injuries which result in the longest periods off duty and which often cause permanent disability.

With the co-operation of Dr. P. S. Chappell, Medical Superintendent, Wooroloo Hospital, Mr. D. J. Kemp, Senior Physiotherapist, was seconded from that hospital for one week a month, commencing in May. During each of these weeks, he has visited a number of departmental hospitals outside the metropolitan area. At each of these visits he has given lecture demonstrations in kinetic handling methods, especially the lifting of patients, to hospital staff, especially the nursing staff.

It is anticipated that it will take approximately twelve months to visit all departmental hospitals. At the end of that time, the possibility of a permanent appointment of Kineticist will be considered.

AIR POLLUTION

Scientific Advisory Committee

The following members of the above Committee were appointed in December, 1965 by the Air Pollution Control Council—

Mr. L. J. Brennan	Government Chemical Laboratories
Dr. A. R. H. Cole	University of Western Australia
Dr. D. D. Letham	Public Health Department (Chairman)
Mr. G. W. Mackey	Commonwealth Bureau of Meteorology
Mr S. Morgan	Chamber of Manufacturers
Mr D. T. Rigden	Chamber of Manufacturers

The Committee held nine meetings, the main purpose of which was to draft Regulations of the Clean Air Act. Drafts of the Regulations were submitted to the Air Pollution Control Council, which approved the final draft.

Complaints of Air Pollution

These have continued steadily during the year and were mainly of varous types of dust. A number of these were repeated complaints of pollution from the same source.

The willingness of industry to co-operate in the control of air pollution is increasing. In a few instances, however, it appears that control will not be undertaken unless and until it is required by legislation.

Enquiries

New industries have increasingly made enquiries and sought consultation, especially regarding the heights of chimney stacks.

Visit of Dr. H. H. Macey to the United Kingdom

In October, Dr. H. H. Macey, Engineer, Air Pollution attended the International Clean Air Congress, and other technical meetings, in London. Subsequently, he spent three weeks with the United Kingdom Alkali Inspectorate in the Sheffield area, in the eastern and southern counties and in London itself. He visited iron and steel works, power stations, cement works, oil refineries and a wide variety of other industries. He was thus able to collect valuable information relevent to the control of air pollution in this State. At the same time he gained first-hand experience of the methods of the Alkali Inspectorate which has been established for over 100 years and is universally respected as a world leader in air pollution control.

EDUCATION

Members of the staff gave lectures on aspects of Occupational Health to medical graduates and fifth year under-graduates ; to trained nursing staff ; at technical schools ; at courses of the National Safety Council ; and of the St. John Ambulance Association.

The Physician-in-Charge also gave lectures on Communicable Diseases to student nurses and to students of Health Inspection.

SUMMARY

While the closing of the asbestos mine at Wittenoom will diminish the incidence of asbestosis, new health problems of a different nature may arise with the opening up of extensive ore deposits in the north and north-west.

Hearing loss due to noise is widespread in the community, not only involving heavy industries, such as gold mining, but also possibly school boys.

The extensive use of methyl bromide as a fumigant, especially of ships, has resulted in special legislation for its control.

An endeavour is being made to diminish by educational methods the high incidence of occupational strains and sprains, beginning in hospitals.

The passing of the Clean Air Act has been followed by the appointment of an Air Pollution Control Council and a Scientific Advisory Committee ; and increased activity within the division in air pollution control.

Appendix XI

Technical Information Service and Library

J. F. Woolcott, M. B., Ch. B.

Early in 1966, the Mental Health Services established a completely independent professionally-controlled library of their own. Prevoiusly, the Public Health Department Library had provided a small but efficient library for the use of the Child Guidance Clinic, one of the constituent parts of the Mental Health Services. The Clinic's library was taken over as the basis of that for the Mental Health Services. This move, to establish a mental Health Services Library, is very warmly welcomed by all other libraries in W.A. in the health and medical fields, as the lack of such a library was felt as a serious deficiency in the availability of psychiatric and similar material.

The creation of the two "new" libraries, Fremantle Hospital and Mental Health Services, has meant a considerable increase of work for the Public Health Department Library since both have leant heavily on the older organisation. This is clearly shown in the non-journal loans made to them, a total of 133 items for each of the two. They have thus supplanted our traditional biggest borrower, the Medical Library of W.A., to which we lent 111 items. Other big borrowers are R.G.H. Hospital, Hollywood (85 items), Government Chemical Laboratories (42 items), King Edward Memorial Hospital Library (42 items), Department of Agriculture Library (32 items), State Library (27 items) and Sir Charles Gairdner Hospital (26 items). Other organisations who borrowed items from the P.H.D. Library include private industrial firms, State and Commonwealth Departments and instrumentalities, hospitals, local authorities, etc. Loans outside W.A., slightly smaller at 59 items from the 67 of 1965, were as follows:—

> South Australia (23 items), Victoria (15 items), Queensland (7 items), New South Wales (6 items), Tasmania (5 items), Australian Capital Territory (3 items). It is thus apparent that the Library's material is drawn upon and used by a wide variety of organisations inside and outside the State.

The standard library statistics for 1966 and the previous four years are given below.

Items	1962	1963	1964	1965	1966
General—					
Non-journal publications receive	999	856	727	753	882
Additional journals received	32	24	54	39	30
Total journal titles received	425	449	503	542	572*
Average monthly journal routing	667	674	850	1,145	1,161
Borrowing (excludes routine journals)—					
From all other libraries	308	474	340	437	299
From W.A. Libraries	268	429	280	407	283
From Medical Library of W.A.	193	310	179	232	169
From libraries outside W.A.	40	45	60	30	16
Sending (excludes routine journals)—					
All external loans	194	289	339	720	837
To Medical Library of W.A.	56	41	42	117	111
Number of organisations to whom loans made	24	24	24	43	54
Loans made outside W.A.	N/A	N/A	22	67	59
Photocopies supplied	1,368	1,662	2,965	1,127	1,610

* Includes 16 journals in process of transfer to Mental Health Services Library.

These figures indicate a steady increase in the routine work of the Library, as is only appropriate with an expanding Department. More interestingly, however, there is a big jump of 16.2 per cent. in the total external loans made and a reduction of 31.5 per cent. in the amount we have borrowed from all other libraries. Undoubtedly, the increase in loans is mainly due to the Fremantle Hospital and Mental Health Services Libraries, as noted earlier. But the big reduction in borrowing is a more complex phenomenon explained only in part by the library's increasing self-sufficiency. This latter point is illustrated by the reduction from 30 to 16 of the number of items borrowed from other States. This figure of 16 is the smallest recorded since detailed analyses were first made in 1958.

The system of this Library borrowing journals from, and lending journals to, other libraries for routine circulation continues. For this we borrow from the Medical Library 22 journals, from the University of Western Australia 1, and from Government Chemical Laboratories 1 journal. We had journals to 20 other organisations for this purpose. These are (number of journals in brackets)—Fremantle Hospital (33), Government Chemical Laboratories (17), Mental Health Services (16), Medical Library (13), Sir Charles Gairdner Hospital (10), Perth City Council (8), Shire of Canning (8), Health Education Council (7), Bunbury Town Council (5), Institute of Technology (5), Cancer Council (4), K.E.M. Hospital (4), National Safety Council (4), School of Occupational Therapy (4), Department of Agriculture Library (3), Perth Technical College (3), Pre-Clinical Library (3), R.G.H. Hospital, Hollywood (1), P. & C. Federation (1), and Princess Margaret Hospital (1).

The overall picture is one of an expanding and increasingly used Public Health Department Library, serving not only its own Department and associated bodies, but a wide range of community organisations as well

There were staff changes during the year. Miss M. McGuire who had given years of valuable and unstinted service left to get married and Miss P. Johnston joined the staff.

As the year closed, however, no experienced and trained replacement for Miss McGuire had been obtained and library services were somewhat handicapped as a result.

With the flood increase of technical literature across so many fields these days, no technical library can expect to have all the resources to work alone and the close and friendly co-operation received from many other libraries inside and outside the State is most warmly acknowledged.

Appendix XII

State X-Ray Laboratory

B. E. King, Physicist in Charge, Physics Division

INTRODUCTION

The State X-Ray Laboratory consists of a Medical Physics and an Engineering Division. This report is concerned with the Medical Physics Division, which is responsible to the Radiological Advisory Council for the administration of the Radioactive Substances Act and for the provision of Radiation Protection and Medical Physics Services.

RADIOACTIVE SUBSTANCES ACT

Under the Radioactive Substances Act, radioactive substances may only be used by licensed persons. X-ray apparatus used by dentists or medical practitioners for radiography is required to be registered, but its use is exempt from licencing. Users of fluoroscopic or any other X-ray apparatus must be licenced. The Radiological Advisory Council advises the Minister for Health on the granting of licences and registration. The Council is assisted by a number of sub-committees which are listed below. The members of the Council are—

Dr. D. D. Letham, (Chairman)
Professor C. J. B. Clews
Professor W. J. Simmonds
Professor D. J. Allen-Williams
Mr R. M. Hillman
Dr. P. Breidahl

Meetings of the Council and its sub-committees held during 1966 were as follows—

Radiological Advisory Council	4
Medical Advisory Sub-Committee	3
Dental Advisory Sub-Committee	0
Industrial Advisory Sub-Committee	0
Luminising Compounds Sub-Committee	2
Training and Instruction Sub-Committee	2

Laboratory personnel are appointed as Secretaries to the above bodies, and the Laboratory provides the technical and administrative facilities for the implementation of the Act.

Licences, once granted, must be renewed annually. Registration continues until cancelled by the Minister. In 1965, the Council adopted minimum standards which equipment must meet if it is to be considered for registration. There are separate standards for medical and dental installations.

Particulars of Licences and Registrations

Licences—	
Licences current at 31/12/66	164
New licence applications received during 1966	14
New licences granted during 1966—	
(a) Medical	1
(b) Non-Medical	13
Licences terminated 1966	1
Registrations—	
Registrations Approved during 1966—	
(a) Medical	20
(b) Dental	44
Total Registrations current on 31/12/66—	
(a) Medical	29
(b) Dental	131

Amendments to Regulations

The Regulations under the Radioactive Substances Act, were drawn up almost ten years ago, and in the period since then, there have been many changes in the International recommendations on radiation protection, as well as continued development of the applications of X-rays and radioactive substances. Accordingly, it is found from time to time that the Regulations do not always meet the needs of the current situation, and it is necessary for some clauses to be amended.

In 1966, the Council proposed two amendments. The first removed the exemption from the Regulations of devices containing self-luminous elements based on Radioactive Substances. Luminous devices available today contain much larger activities than was envisaged ten years ago. The second strengthens the regulations dealing with personnel monitoring. The amendments clearly lay down the responsibilities with regard to monitoring and keeping of records for both employers and employees.

Training of Industrial Radiographers

Proposals for a course in radiation safety for industrial radiographers were discussed with the Institute of Technology. It is planned that the course be held during the winter of 1967.

CODES OF PRACTICE

The following codes of practice and publications issued by the National Health and Medical Research Council are distributed by the Laboratory to Licences and Registrants :

Radiation Protection Standards.
Code of Practice for the Use of Ionising Radiation in Secondary Schools.
Code of Practice for the Control and Safe Handling of Sealed Radioactive Sources used in Radiation Therapy.
Code of Practice for Nursing Staff Exposed to Ionising Radiations from Radioactive Substances.

During the year, Laboratory personnel assisted the Luminising Compound Sub-Committee in formulating a Code of Practice for the Use of Radioactive Luminising Compounds.

LABORATORY SERVICES

Film Badge Monitoring Service

The regulations require that all persons who may be exposed to radiation must use some form of personnel monitoring. The Film Badge Service conducted by the Laboratory was established ten years ago and is used by the majority of radiation workers in the State.

In 1966, 10,602 monitoring films were processed and the doses evaluated. The number of persons monitored at 31st December, was 915, an increase of 19 per cent. over the figure for 1965. This number was made up as follows—

Medical, Hospitals	206
Medical, General Practitioners	78
Medical, Radiologists and Miscellaneous	75
Chiropractors	6
Dental	467
Non-Medical	83

The trend in the number of monitoring films processed and the number of persons monitored is shown in Figure one.

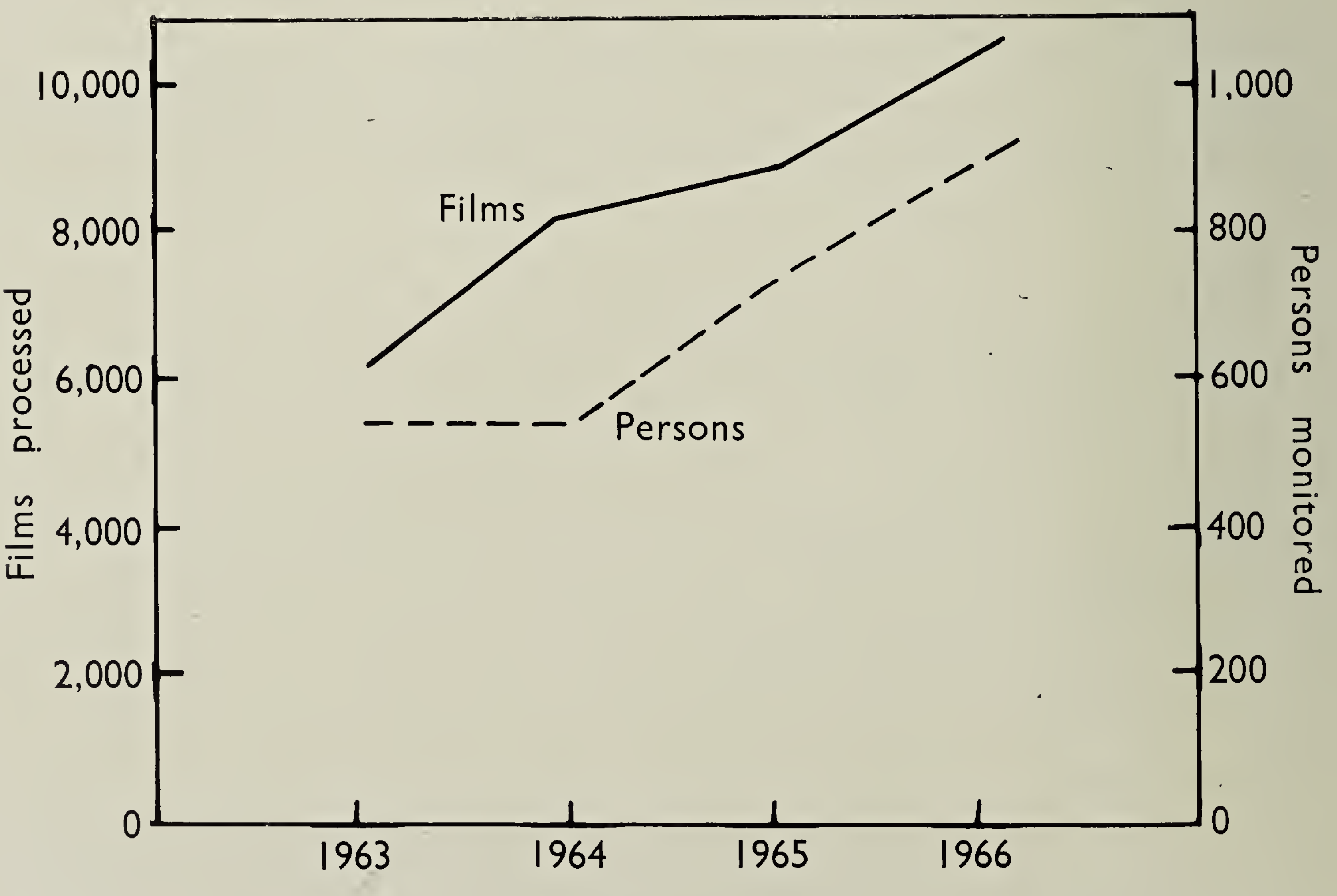


Figure 1.

......../4

The majority of films are worn for a period of four weeks. Where higher dose levels are anticipated, periods of one or two weeks are required. Some users of the film badge service regularly receive very low or undetectable doses. Some centres which conduct film badge services have extended the period of wearing in such cases to as much as four months and this has resulted in a substantial decrease in the number of films issued and processed. Such a procedure is not without disadvatages and the most careful consideration will have to be given to any proposals for similar changes to be made in W.A.

Recent development of the Thermoluminescent Dosimetry system indicates that this method has several technical advantages which may enable it to challenge film badges for personnel monitoring in the fairly near future. The Laboratory is being kept informed of improvements in the system and is in touch with other centres on the subject.

The Laboratory maintains cumulative dose records for all persons in W.A. using film badge monitoring.

Inspection Services

All the technical staff of the Physics Division have been appointed inspectors by the Council under the provisions of the Radioactive Substances Act. There is a continuing programme of inspection of installations of new applicants for licences and registration and of re-inspection of those already licenced and registered.

Number of Inspections, 1966—

Dental	67
Medical	24
Veterinarians	9
Chiropractors	3
Industrial and other non-medical	38

A number of inspections not readily amenable to the above classifications were carried out also. These included inspection of packages at the Customs Department and inspection of various types of Industrial apparatus and Medical and Dental X-Ray equipment at the Laboratory.

Technical Information and Radiation Protection

Frequent requests for advice on radiation hazards, design of protective equipment, applications of radioactive substances and X-rays are dealt with at the Laboratory. A number of protection designs were calculated during the year.

Radiation Standards

The Laboratory's sub-standard X-ray dosemeter is used for the calibration of radiation measuring equipment and for the calibration of superficial therapy X-ray equipment. Six of the latter calibrations were carried out during 1966.

The Laboratory's calibrated radioactive sources are used for the calibration of (1) equipment used for measurement of radioactivity and (2) survey equipment and monitoring films.

Radiation Monitoring Equipment

The Laboratory has a range of monitoring equipment for the field measurement of neutrons, X-rays, and alpha, beta and gamma radiation. Some of this equipment is ten years old and is not as reliable or as versatile as modern equipment. The range of currently available equipment is being investigated with a view to replacement of some items.

Measurement of Radioactivity

Measurement of gross beta activity of rainwater samples has been carried out for some years. Increases in the activity of rain falling in Perth were detected in samples collected on 22nd July, and 1st and 8th August, 1966. This followed the French Nuclear tests on 2nd and 9th July.

Techniques are being refined to permit the measurement of the low levels of fallout and natural activity present in rainwater and biological material when the high activity associated with recent nuclear tests has decayed.

Radiation in the Environment

There are a number of sources of radiation of natural origins to which man is exposed.

1. Cosmic radiation.
2. Gamma radiation from radioactive substances occurring naturally in the environment.

These result in external radiation, but internal radiation also results from the ingestion of foodstuffs and water containing naturally occurring radioactive substances. To these must be added the internal and external radiation resulting from the continued deposition of fallout.

Present contamination of the environment is not great, but it is considered essential that the levels of background radiation be established accurately before further increase occurs. Increases may result from the use of nuclear reactors for propulsion, power generation, distillation of water, as well as nuclear explosions used for peaceful purposes. Without previous measurements having been made it is not possible to detect increases in environmental contamination. Accordingly, a program of measurement of background gamma radiation in the Western Australian environment is being implemented.

Staff

The staff of the Physics Division consists of the Officer-in-Charge, two physicists, a temporary radiation officer, a technician and a part time inspector. In December, physicist L. M. Davies returned from 12 months' study leave spent at the University of Surrey, where he gained the Master of Science in Radiation Protection.

Education

1. Radiographers—

Laboratory staff are responsible for the teaching of Radiographic Equipment A, one of the subjects in the three years course of training for diagnostic radiographers.

2. Nurses—

A series of three lectures on Radioactive Substances and protection are given twice yearly to final year trainee nurses at the Sir Charles Gairdner Hospital.

3. Health and Factory Inspectors—

Trainee Health and Factory Inspectors are instructed on X-rays, radioactive substances and protection as part of their course. Notes for correspondence students have also been prepared.

4. Users of Radioactive Luminising Compounds—

The staff of the instrument section of MacRobertson Miller Airlines were addressed on the hazards of the use of radioactive luminising compounds.

5. Radiation Protection—

Laboratory personnel are frequently called upon to instruct licencees' staff on the safe use and handling of their equipment. In 1966, groups instructed included P.W.D. staff on the safe use of their neutron soil moisture and density measuring instrument.

Lectures

Seminar of the Society of X-Ray Technology and the Australian Institute of Radiography :

" The Image Intensifier "

Civil Defence

Laboratory staff continue to assist the Civil Defence Organisation by lecturing on Radiological Aspects of Civil Defence and advising the organisation on specific questions concerned with monitoring and radiation protection.

Appendix XIII

Activities of General and Meat Inspection Branch

A. A. Pilbeam, Chief Inspector

GENERAL SANITATION REPORT

The Annual Report for 1965 made particular note of the ever increasing responsibilities of this branch due to rapid developments throughout the State.

It stressed the need for providing increased staff to maintain reasonable pace with these conditions.

It is most pleasing to record that these requests received attention and some assistance in staff increases became evident during 1966. This applied to both the General and Meat Inspection Staffs.

Additional Officers appointed to the General Inspection Staff during 1966, numbered three (3), and were—

Mr N. G. Allan
Mr R. W. Sweetman
Mr S. L. Kennedy

These appointments were made from the existing Meat Inspection Staff, with the subsequent vacancies being adequately filled by Messrs J. Bombara, B. A. Bowden and B. Devine, who was transferred from the Clerical Staff to the Meat Inspection Branch, after he had suitably qualified in the field of Meat Inspection.

The Cheif Inspector, Mr A. A. Pilbeam, was absent for an extended period during the year on Long Service Leave, and his position was ably filled during this time, by the Senior Inspector of the General Inspection Staff, Mr J. F. Slattery.

The additional support to the Inspection Staff noticeably provided impetus to their efforts and as the year proceeded, it was evident that accomplishment was to be the keynote for 1966. New fields relating to Public Health affairs were noticed and later became the subjects of closer scrutiny and examination.

Existing circumstances dictated the need for wider research into specific fields, and this need became the functioning pattern for several individual members of the Staff, who began specialising in several particular problems. Significant progress towards tangible and valuable results were noticeable before the year closed.

The progress in the Northern Districts continued to accelerate and finally decided the issue for employing further Health Inspection Services in these Areas.

NORTH WEST HEALTH INSPECTION

Arrangements for 1966 were constituted as follows :—

West Kimberley Regional Group—Mr A. Gilmore supervised this area for part of the year. He ultimately resigned and joined the State Meat Inspection Staff at a later date.

Pilbara Regional Group—Mr C. Dixon. This Group was regrouped during the latter months of 1966. Mr Dixon retained control of the activities of the Coastal Local Authorities, whilst Mr N. Allan was appointed to pay regular visits to the inland areas, from his position in Head Office, on the General Inspection Staff.

Exmouth (*North West Cape Area*)—Mr V. Buchanan.

Branch Activities continued to function throughout the year.

Details relating to these subjects are submitted hereunder.

RUBBISH REPORT

Metropolitan Refuse Disposal Planning Committee—Summary of Activities for 1966

During 1966, the Committee continued to maintain its progressive planning in obtaining improvements in the important health field of refuse collection and disposal.

A total of 17 meetings were held by the Control Committee and the associated zone Committees. Projects planned in 1965 were successfully completed, and new ventures were planned for the forthcoming year.

It is notable that all zone committees meet regularly with a high percentage of attendance by members, and no slacking of interest or endeavour is manifest.

Progress during 1966 may be summarised as follows—

(a) The standard of the land fill sites is being maintained at a high level : Reclamation was completed at three sites during the year and movement and direction of depositors to the new sites was attained smoothly and without difficulty.

(b) The previous recommendation by the Control Committee for Local Authority members to introduce compaction type collection vehicles when existing vehicles became obselete has been actively implemented. Most Local Authorities are now equipped with this type of vehicle and further purchases are planned.

(c) The increasing volumes of industrial type refuse, and the inability of most Local Authorities to provide adequate services of this type was considered during the year. As a consequence, approval was given to two private companies to introduce a " containerised " service, subject to approval first being obtained from the Local Authority on whose area it is proposed to operate, and permission to use the land fill site is also obtained.

(d) The co-ordinated planning between the Committee and a private enterprise for the collection and compaction of derelict car bodies for sale as scrap, has been actively pursued. Approximately 8,000 bodies were disposed of in this manner during the year. Production however, still exceeds removal rate, and stock piles of up to 300 bodies accumulated on land fill sites : Methods of pre-cutting or fracturing are now being explored to enable greater pay loads to eartage vehicles and expedite collection.

(e) The planning method for car bodies was extended to general metallic waste with gainful results. Several districts were cleared of bulk accumulation of refuse by a combined operation with Local Authority Vehicles and the private enterprises vehicles. The former removing general garbage and the latter collecting metallic scrap. The ventures proved economically successful to the participating parties in addition to providing a district clean up.
Furthering of this aspect is planned for 1967.

(f) Co-ordinated planning with the Australian Paper Manufacturers for collection of waste paper has been furthered. The entire area of the zone organisation is now being serviced. Collections per month average 180 tons, representing 1,440 cubic yards of waste paper as refuse which did not require collection by Local Authority vehicles, nor disposal on a land fill site.

(g) The anti-litter campaign introduced in 1965 has been activily pursued.
Local civic organisations have co-operated in a district clean up. Projects have been introduced into primary and secondary schools and action on a local Authority level has been introduced into all zones.

(h) Final stages of planning for collection and disposal of contents of septic tanks and disposal systems were completed in 1966. All Local Authorities in the various zones are now undertaking the service themselves or have employed an approved contractor. Rate payers are advised on the action to be taken when the service is required, by regular advertising in the daily press.

The introduction of controlled methods has permitted an accurate estimate of quantities requiring disposal, which has been established as in excess of 13,000,000 gallons yearly, and increasing.

Planning for suitable treatment and disposal of this material is now proceeding.

SUB-DIVISION OF LAND

Proposals for Sub-division 1966—

Metropolitan	701
Country	48
State Housing Commission	28
Area Suveys	27
Appeals	16
Taxation Department	19
Industrial Development	11
Public Works Department	5
General Enquiries, Local Authorities, etc.	395
Total	1,250

ROYAL SHOW

Departmental interest in the relevant aspects of the Royal Show continued to increase, and the Show ended for 1966 with further improvements being evident in ground and food handling sanitation.

The management and control of these affairs were effectively handled by Mr A. V. Benjafield, and four other Departmental Inspectors.

FLY CONTROL

The interest and ready co-operation of most metropolitan Local Authorities continued to be apparent in this field during the year 1966. A total of 35,416 premises were visited, during the time of the Annual Fly Control Campaign. The amount of 2,785 fly breeding places were detected in these premises.

Sixteen Local Authorities participated and employed 45 University Students for from four to ten weeks. This included participation by the Busselton Shire Council.

Detailed information as to the effectiveness of the 1966 Fly Control Campaign is appended to this report as Tables "A" (page 107) and "B" (page 108).

MOSQUITO CONTROL

Routine checks on a number of known mosquito breeding locations continued throughout the year. Appropriate eradication measures were taken where necessary.

PEST CONTROL

Increased activities in the Section were maintained during the year under the interested and able guidance of the Pest Control Officer, Mr J. Fowler. I am most grateful for the continued and valuable support of his Section in this important field of Public Health.

The functions of the Pest Control Section covered the following—

(a) Testing new inseticides for fly larvae control in Battery Caged Poultry Farms.
Septic tanks for mosquito larvae control.

(b) Specimens of snails were regularly collected from the Wagin Lakes during the summer months. They were forwarded to the Department of Parasitology, Sydney University, for research purposes.

(c) Inspections of Pigeon Island and Abrolhos Group, were carried out to determine the results of the 1965 rat baiting campaign.
Results appeared to be successful.

(d) Commenced inspections of battery caged poultry farms and schools, to determine the incidence and concentration of fly breeding.

(e) A total of 234 inspections were made during the year at abattoirs and Government institutions with regards to fly breeding.

(f) Inspections at Subiaco and Swanbourne Sewage treatment works, accounted for 104 inspections for the year.

(g) A rat eradication programme was initiated at the new Regional Hospital at Bunbury.

Listed below is a chart showing a comparison of the Pest Control Activities performed for animal, insect and other pests over the 1965 and 1966 periods—

Item	Animal Control			Insect Control									Other
	Rodent	Cat	Possum	Fly	Cock-roach	Bee	Ter-mite	Silver Fish	Ant	Flea	Mosq-uito	Midge	Pigeon Mite
Number of Cases													
1966	268	12	....	78	199	5	86	11	29	13	6	19	5
1965	217	27	9	91	159	7	54	5	11	7	13	. .	7

Total, 1966 731
Total, 1965 607

RESULTS OF ROUTINE INSPECTIONS

Septic Tanks

Total applications received	9,003	
Total Combined systems	8,039	89.29%
Total Separate systems	964	10.71%

The following represents graphically the rise in the incidence of use of the combined septic tank systems, (Fig. 1) together with a comparison of the total applications received (Fig. 2) over the period 1959–66 inclusive.

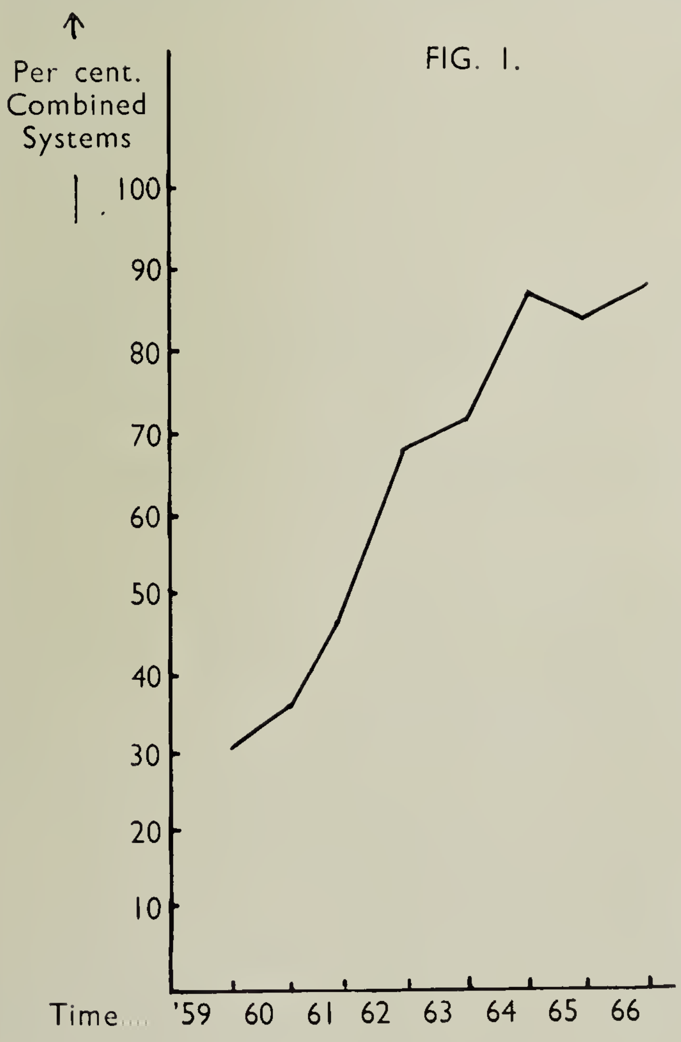


FIG. 1.

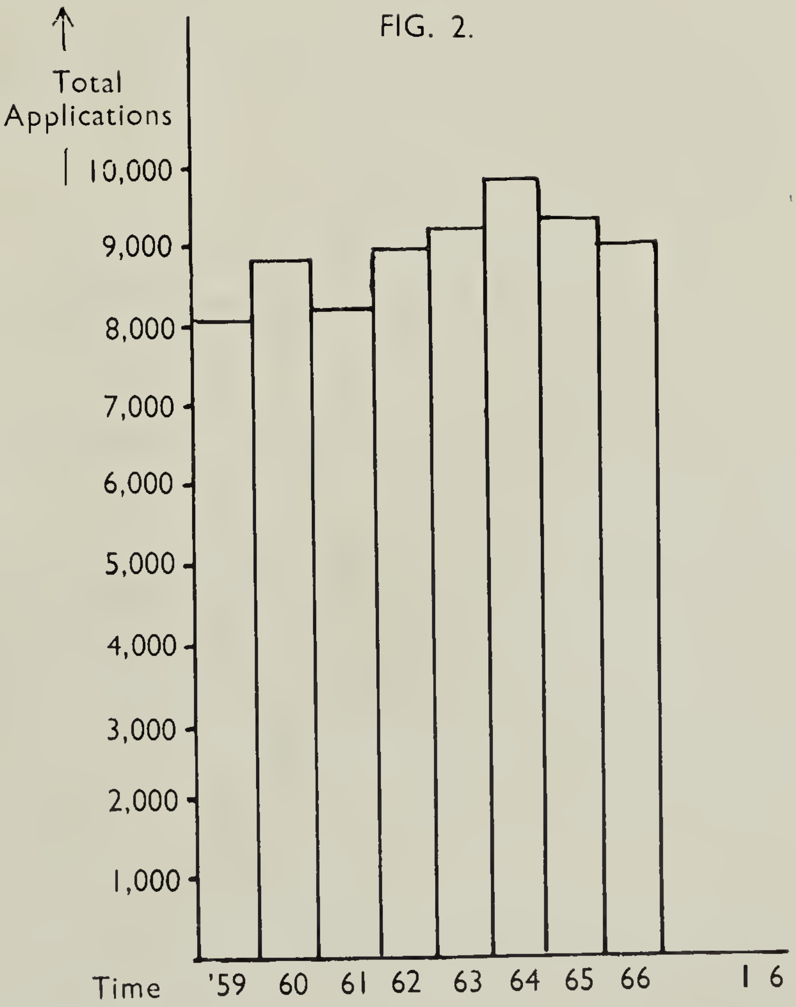


FIG. 2.

Inspection of Six Pint Flushing Systems

Six pint cisterns	120
Six pint pans	78

Inspection of Imported Frozen Fish at Fremantle Wharf

Total examined—2,522.86 tons. This shows an increase of 41.3 per cent. on the 1965 period.

Inspection duties at the Wharf received increased attention during 1966. The scope of Departmental inspection duties was considerably widened, with a view to covering the ultimate examination of all imported Food Stuffs, intended for consumption in this State.

Food and Water Sampling

Food	200
Miscellaneous	20
Reservoirs	72
Swimming Pools	544
Ocean Beaches	759
Total procured	1,595

General Inspections

Towns—45, including Hospitals and special inspections.

EXPERIMENTAL PROJECTS

This phase of duties was initiated during 1965, and received wide attention for the year 1966.

Items concerned were—

(a) The problem of providing satisfactory methods for the disposal of liquid wastes, was further investigated with encouraging results becoming evident.

(b) Experimental septic tank systems received further attention.

(c) The proposed legislation covering the Marketing of Wet Fish was reaching finality as the year closed.

(d) Close liaison was maintained during the year with the Management of all North West development projects.

A code of practice to govern standards for temporary housing and camping arrangements was prepared and introduced as Departmental recommendations. Mr W. Riley capably handled these affairs as Departmental Liaison Officer.

Projects Commenced During 1966

A review of the Camps and Caravan Regulations in company with the Tourist Development Authority and the Department of Local Government was commenced.

A restricted survey of the existing conditions in some State School Canteens was made.

Regular Sampling of Imported Prawns, received attention.

Draft Regulations covering improvements for the control and management of Hairdressers establishments were commenced.

Similar Procedures were begun for—

Meat Transport Regulations.

Control and Management of Dairy Premises in Country Districts. (Draft Regulations were prepared by Mr R. C. Zehnder in Liaison with Officers of the Dairy Division, Department of Agriculture)

Control and Management of Country Slaughter-yards. (The preparation of Draft Regulations was considered)

Proposed Regulations to control the standards of Imported Foods intended for distribution into this State were commenced.

Regional Health Inspection Group

A concentrated Departmental effort to establish some sort of Health Inspection coverage over all Local Authority areas throughout the State was commenced during 1966.

Numerous working Groups were formed, and are now functioning satisfactorily.

The proposed programme was severely curtailed, however, due to the lack of suitably qualified personnel to fill the positions which were offering.

Approximately two thirds of the State was covered by this programme by the end of 1966.

HEALTH INSPECTORS' LIAISON GROUPS

These Groups were formed in an effort to obtain uniformity and co-ordination with established Health Inspection practice, and to keep Local Authority Inspectors conversant with Departmental practice and policy.

As usual, the Local Authority system throughout the State responded magnificently and four (4) active Groups were formed and regularly functioned throughout the year.

A plan showing the extent of participation is shown appended to this report as Table "C".

ANNUAL HEALTH INSPECTORS' CONFERENCE, 1966

A very successful Annual Conference was held during September, 1966, at the Rosehill Country Club, Guildford.

Lectures were of high quality and were delivered by appropriate and competent personnel.

Arrangements for the successful functioning of the Conference were ably handled by a well established Conference Planning Committee, which had suitable Local Authority and Departmental representation.

MEAT INSPECTION

This aspect of Departmental responsibility received attention from a co-operative staff, headed by the Senior Meat Inspector, Mr C. Virgo.

Staff changes evident during 1966 were as follows—

New Appointments.

- Mr J. Bombara
- Mr B. A. Bowden
- Mr B. Devine
- Mr M. Epis, who was transferred from the staff of the Department of Agriculture, Kalgoorlie.

Mr Epis remains in charge of Meat Inspection duties for the Department of Public Health in Kalgoorlie.

Figures relating to Meat Inspection procedure are appended to this report as Appendix XXII.

ACKNOWLEDGEMENTS

It would not be reasonable to conclude this report without special references and acknowledgement to the many avenues from which I received unstinted support and assistance. These include—

The Professional and Administrative Officers of the Public Health Department, who have provided the opportunities of advancement and achievement, in the General and Meat Inspection Branches of the Department.

The Technical Information Service and its Staff. They provided the Technical Information which is so vital to the proper functioning of the General Inspection Branch.

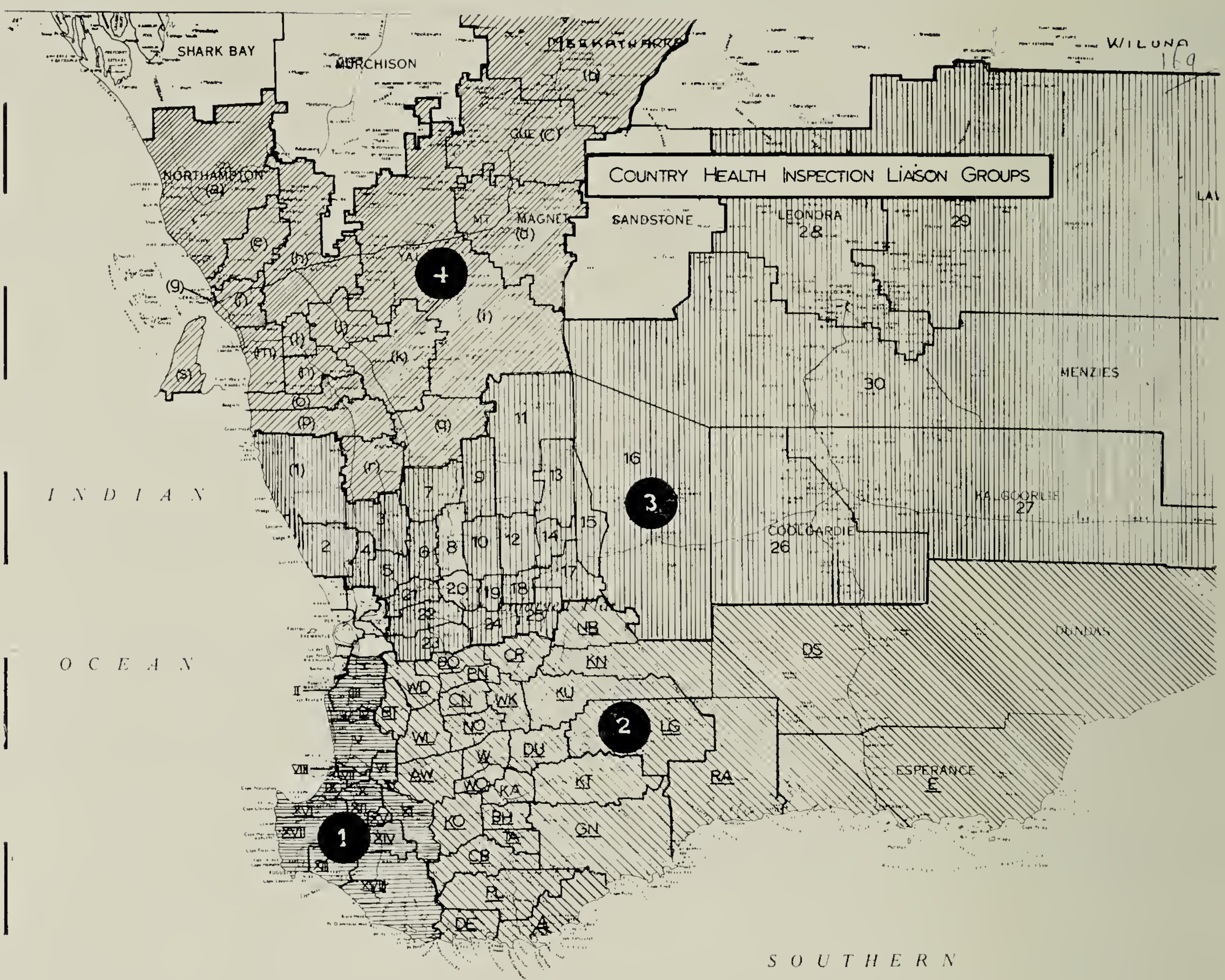
The active and increasing support of Local Authorities throughout the State.

This support is highlighted by the satisfactory functioning of the Health Inspection Services now established in Western Australia.

Finally, I extend my gratefull thanks to all members of the General and Meat Inspection Staffs, who have unfailingly supported me during the year 1966.

Table "C"

Country Health Inspection Liaison Groups



ZONE 1

South-West Health Liaison Committee

(I)	Serpentine-Jarrahdale
(II)	Mandurah
(III)	Murray
(IV)	Waroona
(V)	Harvey
(VI)	Collie
(VII)	Dardanup
(VIII)	Bunbury
(IX)	Capel
(X)	Donnybrook
(XI)	Upper Blackwood
(XII)	Balingup
(XIII)	Nannup
(XIV)	Bridgetown
(XV)	Green Bushes
(XVI)	Busselton
(XVII)	Augusta-Margaret River
(XVIII)	Manjimup

ZONE 2

Goldfields Health Liaison Committee

BT	Boddington
WD	Wandering
BO	Brookton
PN	Pingelly
CR	Corrigin
NB	Narembeen
KN	Kondinin
KU	Kulin
LG	Lake Grace
DU	Dumbleyung
WK	Wickepin
CN	Cuballing
NO	Narrogin
W	Wagin
AW	West Arthur
WO	Woodanilling
WL	Williams
KO	Kojonup
KA	Katanning
BH	Broome Hill
TA	Tambellup
KT	Nyabing-Pingerup
GN	Gnowangerup
RA	Ravensthorpe
DS	Dundas
E	Esperance
CB	Cranbrook
PL	Plantegenet
DE	Denmark
A	Albany Town and Shire

Table "C" – continued

ZONE 3

Central Districts Health Liaison Committee

1. Dandaragan
2. Gin Gin
3. Victoria Plains
4. Chittering
5. Toodyay
6. Goomalling
7. Wongan Hills
8. Dowerin
9. Koorda
10. Wyalkatchem
11. Mount Marshall
12. Trayning, Kununoppin. Yelbeni
13. Mukinbudin
14. Nungarin
15. Westonia
16. Yilgarn
17. Merredin
18. Kellerberrin
19. Tammin
20. Cunderdin
21. Northam
22. York
23. Beverley
24. Quairading
25. Bruce Rock
26. Coolgardie-Boulder
27. Kalgoorlie Shire and Town
28. Leonora
29. Laverton
30. Menzies

ZONE 4

Northam Districts Health Liaison Committee

(a) Northampton
(b) Meekatharra
(c) Cue
(d) Mount Magnet
(e) Chapman Valley
(f) Greenough
(g) Geraldton Town
(h) Mullewa
(i) Yalgoo
(j) Morawa
(k) Perenjori
(l) Mingenew
(m) Irwin
(n) Three Springs
(o) Carnamah
(p) Coorow
(q) Dalwallinu
(r) Moora
(s) Exmouth

Table "A"

FLY CAMPAIGN 1966/67

Comparison with 1965/66

Local Authority	Number of Premises Visited		Number of Houses Breeding Flies		Percentage of Houses Breeding Flies	
	1965/66	1966/67	1965/66	1966/67	1965/66	1966/67
Metropolitan—					%	%
Shire of Armadale/Kelmscott	1,255	1,508	125	114	9·9	7·6
Shire of Bayswater	1,808	2,536	237	445	13·1	17·5
Shire of Bassendean	1,586	611	86	26	5·4	4·3
Shire of Belmont	5,704	6,951	689	351	12·0	5·05
Shire of Canning	....	869	....	190	....	21·9
Shire of Cockburn	600	789	70	66	11·6	8·4
Town of Cottesloe	2,347	2,199	228	149	9·7	6·8
City of Fremantle	5,636	6,579	390	186	6·9	2·8
City of Nedlands	1,555	1,634	146	116	9·3	7·09
City of Perth	3,748	2,001	208	126	5·5	6·2
Shire of Peppermint Grove	451	415	29	29	6·4	7·0
Shire of Perth	4,998	3,801	443	364	8·8	9·6
City of South Perth	3,801	3,377	584	343	15·3	10·3
City of Subiaco	....	948	....	203	....	21·4
Shire of Swan/Guildford	1,126	1,198	146	77	12·9	8·0
Country—						
Town of Busselton	....	1,227	....	157	....	12·7

Table "A"

PARTICULARS OF BREEDING SITES

1966/67 Figure Compared with 1965/66

	1965/66	1966/67
	%	%
Rubbish Bins	38.6	36.1
Rubbish Pits	9.5	8.5
Poultry Pens	8.8	11.1
Incinerators	1.9	2.5
Garden Beds	4.6	4.2
Lawn Clipping Heaps	22.1	19.8
Manure Heaps	9.1	11.6
Compost Heaps	4.3	5.1
Others	1.1	0.9

Table "B"

STATISTICAL SUMMARY OF ANNUAL FLY CAMPAIGNS FROM 1960

Year	Number of Local Authorities		No. Vacancies	No. of Students Trained	No. of Courses	No. Available	Number employed	Previously Trained Students applied	Previously Trained Students employed	Total No. of Weeks	No. of Premises visited	No. of Premises breeding flies	Per cent of Houses breeding flies	No. breeding places found	Breeding Sites							
															Major		Secondary		Minor		Other Causes	
	Met.	Country													Rubbish Bins	Lawn Clippings	Buried Food Waste	Poultry	Incinerators	Blood and Bone		
1960–61	4	....	5	5	1	5	5	....	....	20	3,171	358	11·3	426	Not Available							Info. Folio 74. 738/61
1961–62	22	1	61	68	6	68	61	....	....	....	13,906	....	22·3	4,267	1,231	1,247	269	546	106	50	818	* See below
1962–63	19	....	60	74	4	72	45	20	20	465	50,421	12,302	23·5	12,302	2,292	2,387	1,920	1,464	397	....	3.842	
1963–64	20	2	60	47	4	47	47	22	22	416	55,974	6,031	10·0	6,956	1,728	954	766	688	176	5	2.639	
1964–65	18	2	44	31	3	31	30	36	30	287	37,355	3,757	10·0	4,003	1,205	779	472	440	132	7	968	
1965–66	16	1	44	25	3	25	20	30	26	289	37,280	3,515	9·4	3,731	1,441	824	353	327	70	4	712	
1966–67	15	1	45	27	3	27	27	31	24	289	35,416	2,785	7·9	2,970	1,080	589	252	329	74	9	637	

* Figures for 1961–62 are not complete for breeding sites. Local Authority returns are from Gosnells, Armadale, Mundaring, Bayswater, Swan, Subiaco, Rockingham and Cottesloe.

Appendix XIV

Public Buildings Section Report

R. T. Dunstan, Senior Inspector

There has been a further increase in the number and value of public buildings approved this year. In all 369 buildings to a total value of $14,188,532 were approved by this section. These buildings include civic centres, town halls, assembly halls, theatres, concert rooms, schools, churches, grandstands, public swimming pools, private hospitals and temporary public buildings.

Details of these approvals are as follows—

Privately Owned Buildings	
New Work	145
Additions and Alterations	155
Tents and Temporary Buildings	2
Government Buildings (Designed by Private Architects)	
New Work	24
Additions and Alterations	43
	369

Frequent checks on old and new public buildings with regard to the general maintenance and the electrical installation are carried out by this section.

The added volume of work necessitated the engagement of a typist-clerk for this section to deal with the increasing correspondence and records.

The Officers of this section are constantly engaged in studying new building trends and the use of the ever increasing number of new building materials which are becoming available.

In order to ensure public safety it is necessary to assess the suitability of all building materials, particularly combustible lining materials, for use in public buildings.

Owing to the increasing complexity of modern lining materials, a committee has been formed to assist them in the evaluation of these materials.

This committee comprises a represetative from each of the following bodies.

W.A. Fire Brigades Board
Government Chemical Laboratories
Architectural Division, Public Works Department
Local Government Department
Institute of Architects
W.A. Chamber of Manufactures
Public Health Department

Although private swimming pools are not subject to the Health Act (Swimming Pools) Regulations this section has given considerable advice to the public, regarding construction and water treatment.

Water tests have been carried out at all public swimming pools, completed this year within a radius of 60 miles of Perth and at country centres where an officer of this section has called on official business.

Inspections have been made of buildings used by the public at the Royal Agricultural Show Grounds, Claremont, prior to the Royal Show with respect to the safety of general construction and electrical installations.

Appendix XV

Suicide and Self-Inflicted Injury

Since 1958 Morbidity Statistics have been maintained for patients admitted to the major hospitals in metropolitan Perth. These statistics are recorded in an abbreviated form in an annual tabulation in the Commissioner of Public Health's Annual Report.

This report gives a more detailed breakdown of the statistics concerned with Suicide and Self-Inflicted Injury (E Code 970-979). The information regarding the unsuccessful suicides is obtained from the hospital morbidity statistics. Information regarding the successful suicides is extracted from mortality statistics in the Statistical Register. The paper deals with the consolidated statistics collected over the eight years, 1958-1965.

The programme for the extraction of data shown in the following tabulations was prepared in the department of the Government Statistician and the data was extracted by the computor in that Department.

Table I shows that during the eight years under review 1,900 unsuccessful suicides were treated in metropolitan hospitals. During the same time there were 510 fatal suicides in the metropolitan area and 326 outside the metropolitan area in the rest of the State.

The pattern of suicide or suicidal attempt is quite different between male and female and different between metropolitan area and country.

There were 681 unsuccessful attempts by males in the metropolitan area and 332 successful or fatal suicides, a ratio in the vicinity of 2 to 1. In the females the corresponding figures are 1,219 and 178, a ratio of 7 to 1.

If Table I is examined in conjunction with Table II it is seen that the most prevalent form of attempted suicide is overdose of analgaesic or soporific substances with the barbiturates by far the most popular choice. Although these drugs produce the highest number of fatal suicides they are comparatively ineffectual considering the large number of unsuccessful attempts that are made with them. They are, however, twice as successful in men as in women. The same applies to other forms of poisoning, the women being even still less successful.

Where women are determined to be successful they choose domestic gas or drowning, as man chooses the exhaust from his car, hanging or gunshot. There is a tendancy too, where cutting instruments are involved, for a woman to cut her wrists and a man to cut his throat.

The availability of the instrument for committing suicide appears to play a large part in its choice. As already noted women use the gas oven, men the car exhaust. Country people show a preference, particularly in men, to poisons other than soporifics. Pest exterminating poisons are freely available in the country. Men in the country use firearms as their favourite form of committing suicide.

This raises the inevitable question ; does the availability of a means of suicide play any part in determining whether or not suicide takes place or does it merely determine the type of suicide. Would the countrymen have died if they hadn't had a rifle handy ; would the housewives have died if they hadn't had a gas oven?

As the populations of country and metropolitan area are roughly the same, 510 fatal suicides in the metropolitan area against 326 in the country indicates a greater tendency to suicide in the city. This is also suggested in the Occupational Table V where suicides in Agricultural Workers and Miners are lower than in the other groups.

Table III shows the distribution by age and sex of the various methods of attempting suicides. Table IV shows these figures for the metropolitan area and the successful suicides for the State worked out to an index of unsuccessful and successful suicides per 10,000 of the population per annum and these indices are graphically displayed in the accompanying graph. From the latter we get the extraordinary picture of the high rate of self-inflicted injuries and unsuccessful suicides in the young with a rapid decline in such attempts in middle age onwards. Successful suicides on the other hand increase with age with the male peak at 65-69 and the female peak at 55-59. Successful suicide in males is more than twice as prevalent as in females but unsuccessful attempts in males are little more than half such attempts in females. The peak of unsuccessful attempts occurs in both ages in the 20-24 age group.

Table V tries to illustrate the significance of occupation in attempted suicide. The attempted suicides in the various occupations are shown as a percentage of the total admissions in these occupations.

Table VI shows a breakdown of the occupational groups with a high incidence of attempted suicide, into male and female components to indicate the influence of the female on the total figure. The figures are unfortunately limited in their usefulness because of the non-recording of occupation in a disproportionately large number of admissions other than attempted suicide.

We get the impression, however, that agricultural workers and miners are singularly free from attempted suicide. The exception is the extraordinary high figure for shearers. The figure here of 3.43 per cent. of admissions is the highest recorded, if two air hostesses are omitted, and is free from any female influence.

As might be expected high incidence groups are groups in which young females are employed but a significant number of males appear in such groups as students, clerks, shopkeepers, salesmen, stonemasons and shearers, to suggest that a special suicidal tendency is associated with such occupations.

Discussion

Suicide in Western Australia accounts for over 100 deaths per year or roughly half the number of deaths caused by motor vehicle accidents. The mortality caused by this disease is therefore of some importance being tenth on the list of Principal Causes of Death. It is, however, inadequately investigated or statistically recorded to allow a proper assessment to be made of cause and prevention.

Fatal suicide attempts are dealt with in the Coroner's Court where only immediate causes of death are dealt with as a matter of interest. The non-fatal attempts are all too frequently treated in our hospitals for the immediate effects and too little attention paid to the underlying cause. There is a great need for a thorough psychiatric investigation of every case of attempted suicide and for adequate follow-up treatment.

Our statistics are inadequate in that we can form no idea of what proportion of the attempted suicides in early life become successful suicides in later life. This gap in our statistics can only be filled if a means of patient identification is included in our statistical records, such as the patient's name and date of birth.

By such means medical record linkage may not only be possible from hospital to hospital but also with the Coroner's Court and the death certificate presented to the Registrar General.

Our figures show a high rate of attempted suicide in the young, particularly in women, and a high rate of fatal suicide attempts in the elderly, particularly men, but we don't know how many of the unsuccessful attempts were meant to be fatal and how many of the fatal attempts were really not meant to be fatal. We see clearly that where a means of suicide is readily at hand it is the means most frequently used, but we don't know how much influence its ready accessibility actually played in producing the attempt. Some connection between occupation and attempted suicide has been shown, but how much this reflects the true picture when fatal suicide is considered is unknown.

We can only conclude that suicide is a prevalent and highly fatal disease which at present is being inadequately investigated in the field of medical statistics.

Summary

Morbidity statistics, covering eight years, of non-fatal suicide attempts and self-inflicted injuries are recorded from the metropolitan general hospitals in Perth.

Statistics of fatal suicides for the metropolitan area and the State for the same period are given.

The figures are arranged to show the prevalence of the above by age and sex and some attempt has been made to analyse the influence of occupation.

A need for improved statistical recording and processing is indicated.

W. S. DAVIDSON,
Commissioner of Public Health, Western Australia.

Table 1

1958–1965 INCLUSIVE

	E–Code No.	Metropolitan Area Unsuccessful Suicides		Metropolitan Area Successful Suicides		Remainder of State Successful Suicides	
		M	F	M	F	M	F
Suicide and self-inflicted poisoning by analgesic and soporific substances	970	485	1,005	88	87	16	23
Suicide and self-inflicted poisoning by other solid and liquid substances.	971	62	143	17	7	25	17
Suicides and self-inflicted poisoning by gases in domestic use.	972	11	13	23	37	2	....
Suicides and self-inflicted poisoning by other gases.	973	15	1	76	8	50	....
Suicide and self-inflicted injury by hanging and strangulation.	974	3	1	42	9	31	3
Suicide and self-inflicted injury by submersion (drowning).	975	1	2	19	18	11	10
Suicide and self-inflicted injury by firearms and explosives.	976	12	2	41	3	118	6
Suicide and self-inflicted injury by cutting and piercing instruments.	977	76	44	10	....	5	1
Suicide and self-inflicted injury by jumping from high place.	978	4	1	9	3	1	1
Suicide and self-inflicted injury by other and unspecified means.	979	12	7	7	6	5	1
Totals		681	1,219	332	178	264	62

Table 2

MAJOR "N" CODE CLASSIFICATIONS OF SUICIDE AND SELF-INFLICTED INJURIES (NON-FATAL)—1958–1965

"N" Code		Total		Percent	
		M	F	M	F
874	Open wound of neck	14	5	2·05	0·41
879	Multiple and unspecified open wounds of face, neck and trunk	11	2	1·61	0·17
881	Open wound of elbow and forearm and of wrist not involving tendons	22	22	3·23	1·80
882	Open wound of wrist involving tendon(s)	12	5	1·76	0·41
961	Poisoning by alcohol	9	7	1·32	0·57
968	Poisoning by carbon monoxide	22	12	3·23	0·98
971	Poisoning by barbituric acid and derivatives	310	653	45·52	53·57
972	Poisoning by aspirin and salicylates	17	52	2·49	4·26
973	Poisoning by bromides	9	14	1·32	1·15
974	Poisoning by other analgesic and soporific drugs	74	147	10·85	12·06
979	Poisoning by other and unspecified substances	112	243	16·44	19·94
	Others	69	57	10·18	4·68
	Totals	681	1,219	100	100

Table 3

SUICIDES AND SELF-INFLICTED INJURIES (NON-FATAL)—1958-1965 INCLUSIVE

Item		"E" Code	All Ages		Ages Unstated		Under 15 years		15–19 years		20–24 years		25–29 years		30–34 years		35–39 years		40–44 years		45–49 years		50–54 years		55–59 years		60–64 years		65–69 years		70–74 years		Over 75 years	
			M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
1	Poisoning by Analgesic and Soporific Substances	970	485	1,005	5	2	14	26	40	162	66	142	47	118	56	123	59	105	51	89	39	66	30	76	24	30	28	27	10	16	8	8	8	15
2	Poisoning by other Solid and Liquid Substances	971	62	143	....	2	7	10	2	20	10	26	6	18	10	14	9	17	5	11	7	10	3	6	...	5	1	2	....	....	1	1	1	1
3	Poisoning by Gases in Domestic Use	972	11	13	....	....	....	1	2	1	1	1	2	1	..	1	1	2	....	1	1	1	2	....	1	...	..	1	....	..	1	....	...	3
4	Poisoning by Other Gases	973	15	1	....	....	....	....	....	1	3	....	3	....	1	....	1	....	2	....	....	....	3	...	1	.	.	....	1	....	....	....	....	
5	Hanging and Strangulation	974	3	1	....	....	....	....	2	....	1	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	
6	Submersion (Drowning)	975	1	2	....	....	....	....	...	....	...	....	....	....	....	....	..	1	....	....	....	1	1	....	....	....	....	....	. .	....	....	....	.	
7	Firearms and Explosives	976	12	2	....	....	....	....	2	....	1	....	1	....	2	1	1	1	1	....	....	....	2	....	. .	...	....	.	1	....	....	....	1	...
8	Cutting and Piercing Instrument	977	76	44	....	....	....	....	2	7	11	12	7	5	4	5	15	4	6	4	4	2	10	1	4	.	1	...	3	1	4	2	5	1
9	Jumping from High Place	978	4	1	....	....	....	....	....	....	1	....	....	....	....	....	1	....	1	....	..	.	1	1	. .	...	....	...	....	...	....	...	....	....
10	Other and Unspecified Means	979	12	7	....	....	....	1	2	1	....	....	1	2	2	....	2	2	2	1	2	....	....	....	....	....	....	....	....	....	....	....	1	....
Totals		....	681	1,219	5	4	21	38	52	192	94	181	67	144	75	145	89	132	68	106	53	80	52	84	30	35	30	30	15	17	14	11	16	20
Successful Suicides in the State 1958–1965		....	596	240	....	....	1	....	14	7	40	14	31	13	39	15	76	24	43	27	68	28	68	20	70	28	51	21	42	17	26	12	27	14

Table 4

Age Groups	Metropolitan						State					
	Population		Attempted Suicides 1958–1965		Attempted Suicides Per 10,000 Population Per Annum		Population		Fatal Suicides 1958–1965		Fatal Suicides Per 10,000 Population Per Annum	
	M	F	M	F	M	F	M	F	M	F	M	F
Under 15	65,529	62,648	21	38	0·40	0·76	122,611	117,100	1	....	0·01	....
15–19	16,806	17,733	52	192	3·86	13·54	29,609	28,129	14	7	0·59	0·31
20–24	12,351	13,640	94	181	9·51	16·59	24,565	23,312	40	14	2·04	0·75
25–29	11,438	12,387	67	144	7·33	14·54	22,693	21,628	31	13	1·71	0·75
30–34	13,535	13,983	75	145	6·93	12·96	25,748	23,899	39	15	1·89	0·79
35–39	14,444	14,634	89	132	7·70	11·28	26,238	24,396	76	24	3·61	1·23
40–44	12,360	13,266	68	106	6·88	9·99	21,973	21,692	43	27	2·45	1·55
45–49	12,934	13,669	53	80	5·13	7·31	23,098	22,177	68	28	3·68	1·58
50–54	11,907	12,069	52	84	5·45	8·70	21,342	19,034	68	20	3·99	1·31
55–59	10,551	10,463	30	35	3·55	4·19	18,883	15,950	70	28	4·64	2·20
60–64	8,179	9,055	30	30	4·59	4·14	14,099	13,356	51	21	4·53	1·96
65–69	5,627	7,458	15	17	3·34	2·85	9,445	10,795	42	17	5·56	1·98
70–74	4,468	5,885	14	11	3·91	2·34	7,194	8,548	26	12	4·51	1·75
75 and over	4,978	8,136	16	20	4·01	3·08	7,954	11,161	27	14	4·24	1·56
Total	205,107	215,026	676	1,215	4·13	7·06	375,452	361.177	596	240	1·99	0·83

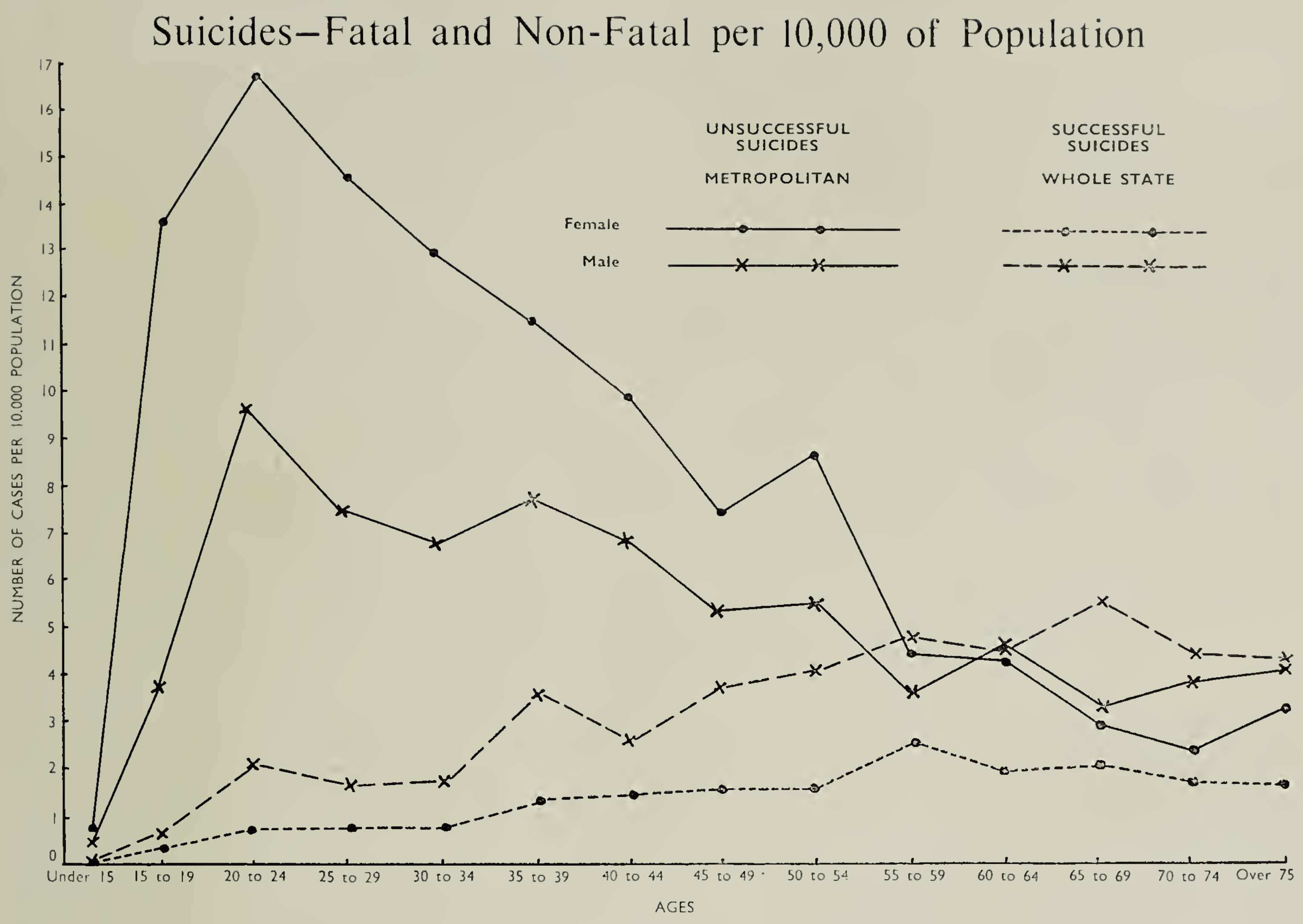


Table 5

OCCUPATIONS OF PERSONS ADMITTED 1958–1965

Occupation	Total Admissions	Attempted Suicides	Percentage
Unstated	114,654	438	0·38
Professional—			
Medical	219	2	0·91
Legal	30	1	3·33
Religious	152	1	0·65
Architects, electrical engineers, surveyors and draftsmen	408	3	0·74
Managers and senior executives	838	11	1·13
Teachers and welfare workers	548	11	2·01
Aeroplane crews and pilots	56	2	3·57
Nurses, hospitals orderlies, nursing assistants and other ward employees, physiotherapists	3,649	49	1·34
School, college and university students	1,355	29	2·14
Others	341	5	1·47
Total	7,596	114	1·5
Clerical and Shopkeepers—			
Clerks and P.O. employees	4,660	91	1·95
Shopkeppers and hotel keepers	805	16	1·99
Salesmen and commercial travellers	895	21	2·35
Shop assistants, hairdressers, barmaids and barmen	1,731	52	3·00
Shoemakers and shoe shop assistants	52	2	3·8
Photographers	44	....	....
Milliners and embroidery workers, dressmakers, clothing machinists	135	2	1·48
Housewife and domestic services	47,991	800	1·67
Male cooks, etc.	40	....	....
Others	1,398	20	0·14
Total	57,751	1,004	1·74
Agriculture—			
Wheat and sheep farming	414	4	0·97
Dairying, piggeries and mixed farming, butter factory employees	244	....	....
Poultry farmers	70	2	2·86
Orchardists, market gardeners, nurserymen and vignerons	665	4	0·60
Forestry, lumbering and sawmills	481	4	0·83
Shearers	233	8	3·43
Butchers, slaughtermen, veterinary officers and meat inspectors, stockmen and jockeys	548	4	0·73
Bakers and millers	372	4	1·08
Bulk grain handlers	7	...	...
Others	1,915	20	1·04
Total	4,949	50	1·0

Table 5

OCCUPATIONS OF PERSONS ADMITTED 1958–1965

Occupation	Total Admissions	Attempted Suicides	Percentage
Engineering and Construction—			
Foundry workers, blast furnace operators, smelters, boilermakers, panel beaters, blacksmiths and moulders	160	....	....
Degreasers, motor mechanics and engineers, fitter and turners, engine room attendants	538	6	1·12
Lead smelters, battery makers, plumbers, solderers, cable makers, enamelers	321	3	0·93
Bronzers and case hardeners	3	....	....
Casting cleaners and sand blasters	1	....	....
Stone masons, rockdrillers, brickmakers, tilemakers, boring contractors, riggers, bricklayers, plasterers	422	11	2·63
Refrigeration workers	32	....	....
Grinders and workers with abrasives	12	....	....
Welders	675	9	1·33
Others	6,826	86	1·26
Total	8,990	115	1·28
Processing—			
Portland cement makers	21	....	....
Electro and chromium platers	6	....	....
Petroleum and kerosene refiners	6	....	....
Rubber processors and vulcanisers	10	....	....
Leather workers and tanners	22	....	....
Fertilizer makers	1	....	....
Insecticide and vermicide makers	7	....	....
Glass mixers, furnace workers, finishers and cutters	54	1	1·85
Tar, bitumen and allied works	2	....	....
Others	124	3	2·42
Total	253	4	1·58
Manufacturers—			
Carders, ragworkers, woolworkers, upholsterers, wool classers	39	1	2·56
Other textiles	43	....	....
Pottery workers	18	....	....
Asbestos sheet and other asbestos goods makers	11	....	....
Electrical condensers, transformers and insulator makers, radio technicians	35	....	....
Beryllium alloy workers	....	....	....
Mirror silverers, thermometer makers and other mercury handlers	5	....	....
Carpenters and woodworkers	423	7	1·65
Others	484	12	2·48
Total	1,058	20	1·9
Chemical and Paint Industry—			
X-ray, uranium, radio-active isotopes and luminous paint workers	17	....	....
Brewers and distillers	14	....	....
Aniline dye workers	3	....	....
Laundry and dry cleaning workers	118	3	2·54
Painters, varnishers, shellacres, japanners, glaziers	629	7	1·11
Aeroplane—dope handlers	2	....	....
French polishers	20	....	....
Chemists, chemical manufacturers and pharmaceutical chemists	86	3	3·5
Laboratory workers	111	....	....
Others	32	2	0·62
Total	1,032	15	1·4
Mining—			
Coal	36	....	....
Lead	3	....	....
Gold	58	....	....
Uranium and other radio-active substances	3	....	....
Asbestos	9	....	....
Iron	6	....	....
Quarrying	14	....	....
Divers and caisson workers, tunnel workers	5	....	....
Manganese	1	....	....
Others	429	1	0·23
Total	564	1	·18

Table 5

OCCUPATIONS OF PERSONS ADMITTED 1958–1965

Occupation	Total Admissions	Attempted Suicides	Percentage
Other Trades, Transports and Utilities—			
Cinematograph operators	8	....	...
Printers, lithographers and compositors	192	5	2·60
Railway drivers, guards, linesmen and signalmen	828	9	1·09
Bus, tram, taxi and transport drivers	2,345	23	0·98
Policemen, firemen, armed services	285	3	1·05
Seamen	1,569	7	0·45
Sewer workers	10	....	....
Electricians and linesmen	714	14	1·96
Dockers and wharf labourers	1,251	13	1·04
Others	5,650	65	1·15
Total	12,852	139	1·08
Grand Total	209,699	1,900	·906

Table 6

MAJOR OCCUPATIONAL GROUPS—UNSUCCESSFUL SUICIDES

	Male	Female	Total
Teachers	4	7	11
Aeroplane Crews	....	2	2
Nurses	6	43	49
Students	12	17	29
Clerks	34	57	91
Shopkeepers	10	6	16
Salesmen	18	3	21
Shop Assistants	6	46	52
Shoemakers	2	....	2
Stonemasons	11	....	11
Chemists	2	1	3
Shearers	8	....	8

Appendix XVI

Royal Perth, Fremantle and Princess Margaret Hospitals

ALL PATIENTS DISCHARGED

Hospital	Year	Number of Cases	Total Days Stay in Hospital	Average Number of Days in Hospital	Daily Bed Average
Fremantle Hospital	1963	8,021	75,972	9·5	208·1
	1964	8,501	78,227	9·2	213·7
	1965	8,961	81,986	9·1	224·5
	1966	8,373	84,917	10·1	232·6
Princess Margaret Hospital	1963	7,382	49,381	6·7	135·3
	1964	6,918	45,616	6·6	124·6
	1965	7,888	54,227	6·9	148·5
	1966	7,699	53,549	7·0	146·7
Royal Perth Hospital	1963	13,283	225,673	17·0	618·3
	1964	15,478	266,503	17·2	728·2
	1965	14,677	259,433	17·7	710·3
	1966	14,974	263,395	17·6	721·6

OPERATION CASES

Hospital	Year	Number of Cases	Total Days Stay in Hospital	Average Number of Days in Hospital	Daily Bed Average
Fremantle Hospital	1963	4,777	41,450	8·7	113·6
	1964	5,187	45,214	8·7	123·5
	1965	5,263	48,768	9·3	133·6
	1966	4,603	44,219	9·6	121·1
Princess Margaret Hospital	1963	2,490	19,112	7·7	52·4
	1964	2,393	17,614	7·4	48·1
	1965	2,537	19,497	7·7	53·4
	1966	2,596	19,826	7·6	54·3
Royal Perth Hospital	1963	5,792	117,072	20·2	320·7
	1964	7,448	144,850	19·4	395·8
	1965	7,085	142,698	20·1	390·7
	1966	7,609	150,449	19·8	412·2

ACCIDENTS, POISONING AND VIOLENCE

Hospital	Year	Number of Cases	Total Days Stay in Hospital	Percentage of Total Hospital Beds Occupied	Number Died
Fremantle Hospital	1963	1,556	15,166	19·96	24
	1964	1,611	14,876	19·02	18
	1965	1,755	18,339	22·37	25
	1966	1,531	18,923	22·28	18
Princess Margaret Hospital	1963	1,346	7,979	18·88	11
	1964	1,369	8,159	17·88	9
	1965	1,598	9,122	16·82	8
	1966	1,684	8,313	15·52	5
Royal Perth Hospital	1963	2,837	50,277	22·26	81
	1964	3,481	58,112	21·81	105
	1965	3,219	64,908	25·02	91
	1966	3,556	59,440	22·57	99

King Edward Memorial and Sir Charles Gairdner Hospitals

ACCIDENTS, POSIONINGS, VIOLENCE

Hospital	Year	Number Of Cases	Total Days Stay in Hospital	Percent of Total Hospital Beds Occupied	Number Died
King Edward Memorial Hospital	1964	11	47	0·10	....
	1965	12	106	0·24	....
	1966	10	51	0·11	....
Sir Charles Gairdner Hospital	1964	99	1,125	1·82	3
	1965	66	659	1·15	2
	1966	167	2,199	2·86	3

King Edward Memorial and Sir Charles Gairdner Hospitals, (continued)

ALL PATIENTS DISCHARGED

Hospital	Year	Number of Cases	Total Days Stay in Hospital	Average Number of Days in Hospital	Daily Bed Average
King Edward Memorial Hospital	1964	4,584	45,716	10·0	124·9
	1965	4,969	43,433	8·7	118·9
	1966	5,215	46,436	8·9	127·2
Sir Charles Gairdner Hospital	1964	2,653	61,948	23·4	169·3
	1965	2,386	57,239	24·0	156·7
	1966	3,877	76,683	19·8	210·1

OPERATION CASES

Hospital	Year	Number of Cases	Total Days Stay in Hospital	Average Number of Days in Hospital	Daily Bed Average
King Edward Memorial Hospital	1964	1,014	10,188	10·0	27·8
	1965	1,254	12,325	9·8	33·7
	1966	2,362	22,860	9·7	62·6
Sir Charles Gairdner Hospital	1964	679	14,208	20·9	38·8
	1965	738	16,252	22·0	44·5
	1966	1,419	28,037	19·8	76·8

Royal Perth, Sir Charles Gairdner, Princess Margaret, Fremantle, and King Edward Memorial Hospitals

ALL PATIENTS DISCHARGED, 1966, IN AGE GROUPS

Age Groups	Number of Cases		Per cent. of Total	Total Days Stay in Hospital		Per cent. of Grand Total	Average No. of Days in Hospital	
	Male	Female		Male	Female		Male	Female
00–14	5,898	4,211	25·19	40,243	30,143	13·41	6·82	7·16
15–19	1,155	1,885	7·57	11,828	15,525	5·21	10·24	8·24
20–29	1,804	4,300	15·21	21,110	37,398	11·14	11·70	8·70
30–39	1,437	2,490	9·78	21,523	26,194	9·09	14·98	10·52
40–49	1,601	1,814	8·51	25,163	25,088	9·57	10·71	13·83
50–59	2,096	1,756	9·60	37,009	30,872	12·93	17·66	17·53
60–69	2,316	2,076	10·94	48,132	41,135	17·01	20·78	19·81
70 and over	2,257	3,042	13·20	46,848	66,769	21·64	20·76	21·95
Total	18,564	21,574	100·00	251,856	273,124	100·00	13·57	12·66
Total Male and Female	40,138			524,980			13·08	

Daily Bed Average : 1,438·3

OPERATION CASES IN AGE GROUPS, 1966

Age Groups	Number of Cases		Per cent. of Total	Total Days Stay in Hospital		Per cent. of Grand Total	Average No. of Days in Hospital	
	Male	Female		Male	Female		Male	Female
00–14	2,282	1,618	9·72	15,359	11,531	5·12	6·73	7·13
15–19	700	913	4·02	8,886	8,257	3·26	12·69	9·04
20–29	1,046	2,005	7·60	14,418	18,269	6·22	13·78	9·11
30–39	771	1,278	5·10	13,534	14,142	5·27	17·55	11·07
40–49	815	1,047	4·64	14,079	14,408	5·43	17·27	13·76
50–59	971	876	4·60	17,652	16,352	6·48	18·18	18·67
60–69	1,039	1,033	5·16	24,256	20,242	8·48	23·35	19·60
70 and over	964	1,231	5·47	22,963	31,043	10·29	23·82	25·22
Total	8,588	10,001	46·31	131,147	134,244	50·55	15·27	13·42
Total Male and Female	18,589			265,391			14·28	

Daily Bed Average : 727·1

Royal Perth, Fremantle, Princess Margaret, Sir Charles Gairdner and King Edward Memorial Hospitals

PATIENTS DISCHARGED DURING 1966

Item	Disease	International Classification Categories	Number of Cases		Number of Days in Hospital		Per cent. of Grand Total	Average Number Days in Hospital		Average Age of Patients		Sex	Results*				
			Male	Female	Male	Female		Male	Female	Male	Female		1	2	3	4	5
1	Tuberculosis—All Forms	001–019	103	74	9,016	6,534	2·96	87·5	88·3	47	46	M.	3	72	19	6	3
												F.	....	59	9	4	2
2	Syphilis, Gonorrhoea and other Venereal Diseases	020–039	18	13	115	201	0·06	6·4	15·5	36	35	M.	3	12	2	....	1
												F.	3	5	3	1	1
3	Other Infectious Diseases	040–138	409	336	4,589	3,362	1·51	11·2	10·0	17	19	M.	22	368	12	....	7
												F.	26	293	10	1	6
4	Malignant Neoplasms, including those of Lymphatic and Haematopoitic Systems	140–205	1,101	988	22,459	20,883	8·26	20·4	21·1	61	61	M.	32	480	341	18	230
												F.	37	514	242	10	185
5	Benign and Unspecified Neoplasms	210–239	162	335	2,155	3,403	1·06	13·3	10·2	37	40	M.	31	111	14	5	1
												F.	87	208	21	18	1
6	Allergic Disorders	240–245	328	387	2,419	3,500	1·13	7·4	9·0	27	34	M.	4	311	10	....	3
												F.	5	352	25	1	4
7	Diseases of Thyroid Gland	250–254	27	95	455	1,459	0·37	16·9	15·4	43	50	M.	6	16	4	1	....
												F.	14	58	20	2	1
8	Diabetes Mellitus	260	79	121	1,519	2,464	0·76	19·2	20·4	49	55	M.	3	57	14	....	5
												F.	....	94	14	....	13
9	Diseases of other Endocrine Glands	270–277	25	34	527	797	0·25	21·1	23·4	40	44	M.	....	17	7	1	....
												F.	1	19	10	1	3
10	Avitaminoses and other Metabolic Diseases	280–289	41	62	950	1,109	0·39	23·2	17·9	41	35	M.	1	28	10	....	2
												F.	2	36	18	2	4
11	Diseases of Blood Forming Organs and Blood	290–299	120	188	1,544	2,741	0·82	12·9	14·6	36	51	M.	2	87	25	1	5
												F.	3	145	27	5	8
12	Mental Psychoneurotic and Personality Disorders	300–326	528	816	6,820	13,172	3·81	12·9	16·1	42	40	M.	6	316	188	4	14
												F.	12	593	205	1	5
13	Vascular Lesions Affecting Central Nervous System	330–334	243	261	8,553	9,629	3·46	35·2	36·9	64	67	M.	....	136	29	....	78
												F.	2	145	32	....	82
14	Inflammatory and other Diseases of Central Nervous System	340–357	334	277	5,146	4,922	1·97	16·2	17·8	33	38	M.	3	220	97	4	10
												F.	7	190	67	4	9
15	Diseases of Nerves and Peripheral Ganglia	360–369	53	77	814	1,568	0·45	15·4	20·4	43	53	M.	....	42	11	....	....
												F.	3	61	13	....	....
16	Diseases of the eye....	370–389	462	416	4,965	4,179	1·74	10·7	10·0	35	42	M.	25	372	63	1	1
												F.	11	332	70	....	3
17	Diseases of Ear and Mastoid Process	390–398	249	251	1,432	1,700	0·60	5·8	6·8	17	24	M.	12	225	12	....	....
												F.	9	227	15	....	....
18	Rheumatic Fever and Chronic Rheumatic Heart Disease	400–416	97	129	2,175	3,258	1·04	22·4	25·3	28	30	M.	....	73	19	2	3
												F.	4	94	24	2	5
19	Diseases of the Heart and Arteries Including Hypertension and Arteriosclerosis	420–456	1,027	843	21,000	17,239	7·28	20·4	20·4	63	65	M.	13	699	107	2	206
												F.	9	583	97	1	153

20	Diseases of Veins and other Diseases of Circulatory System;	460–468	289	314	4,047	5,449	1·81	14·0	17·4	46	53	M.	25	239	14	3	8
												F.	32	257	17	....	8
21	Diseases of Respiratory System	470–527	2,383	1,730	22,150	13,689	6·83	9·3	7·9	28	25	M.	302	1,840	135	10	96
												F.	292	1,338	62	5	33
22	Diseases of Buccal Cavity and Oesophagus	530–539	187	247	981	917	0·36	5·2	3·7	25	26	M.	90	86	10	1	....
												F.	125	113	8	1	....
23	Diseases of Stomach and Duodenum	540–545	283	146	4,196	2,184	1·22	14·8	14·9	49	52	M.	25	231	15	3	9
												F.	13	112	15	....	6
24	Appendicitis	550–553	414	351	3,123	2,477	1·07	7·5	7·1	23	24	M.	283	128	....	2	1
												F.	240	107	....	3	1
25	Hernia of Abdominal Cavity	560–561	393	163	3,997	1,921	1·13	10·2	11·8	42	52	M.	89	273	22	2	7
												F.	41	107	11	1	3
26	Other Diseases of Intestines and Peritoneum	570–578	545	583	5,554	7,307	2·45	10·2	12·5	23	37	M.	56	437	22	14	16
												F.	62	466	26	7	22
27	Diseases of Liver and Gall Bladder	580–586	181	354	3,561	5,899	1·80	19·7	16·7	59	57	M.	20	126	20	3	12
												F.	92	228	17	2	15
28	Diseases of Pancreas	587	52	42	766	533	0·25	14·7	12·7	44	52	M.	1	41	7	1	2
												F.	1	27	5	....	9
29	Nephritis and Nephrosis	590–594	127	95	2,038	1,432	0·66	16·0	15·1	28	29	M.	....	94	19	....	14
												F.	....	73	7	....	15
30	Other Diseases of Urinary System	600–609	304	409	3,811	5,201	1·72	12·5	12·7	46	42	M.	27	202	26	46	3
												F.	37	274	41	48	9
31	Diseases of Male Genital Organs	610–617	404	....	5,808	....	1·11	....	14·4	49	....	M.	73	292	20	10	9
												F.	....	....	....	....	....
32	Diseases of Breast	620–621	9	57	60	302	0·05	6·7	5·3	49	40	M.	3	5	....	1	....
												F.	11	38	5	3	....
33	Diseases of Female Genital Organs, Uterus, Ovary, Fallopian Tubes, Parametrium	622–637	....	1,170	....	9,337	1·78	....	8·0	....	41	M.	....	....	....	....	....
												F.	121	734	95	219	1
34	Complications of Pregnancy	640–649	....	824	....	4,163	0·79	....	5·1	....	25	M.	....	....	....	....	....
												F.	23	789	4	7	1
35	Abortion	650–652	....	492	....	1,645	0·31	....	3·3	....	27	M.	....	....	....	....	....
												F.	119	365	3	4	1
36	Delivery Without Mention of Complication	660	....	3,031	....	30,780	5·86	....	10·2	....	25	M.	....	....	....	....	....
												F.	....	3,031	....	....	....
37	Delivery with Specified Complication	670–678	....	125	....	1,082	0·21	....	8·7	....	25	M.	....	....	....	....	....
												F.	9	116	....	....	....
38	Complications of the Puerperium	680–689	....	17	....	180	0·03	....	10·6	....	27	M.	....	....	....	....	....
												F.	2	14	1	....	....
39	Diseases of Skin and Cellular Tissue	690–716	459	415	6,392	5,465	2·26	13·9	13·2	32	39	M.	42	396	12	2	7
												F.	54	337	9	3	12
40	Arthritis and Rheumatism Except Rheumatic Fever	720–727	168	204	4,976	6,075	2·11	29·6	29·8	46	53	M.	3	135	27	1	2
												F.	2	160	36	4	2
41	Osteomyelitis and other Bone and Joint Diseases	730–738	386	199	6,138	3,475	1·83	15·9	17·5	33	38	M.	25	326	30	4	1
												F.	11	172	14	1	1
42	Other Diseases of Musculoskeletal System	740–749	175	261	2,108	3,174	1·00	12·0	12·2	27	41	M.	8	140	24	....	3
												F.	24	212	23	1	1
43	Congenital Malformations	750–759	341	288	4,210	3,553	1·48	12·3	12·3	12	11	M.	25	217	82	6	11
												F	8	164	97	6	13
44	Birth Injuries, Asphyxia and Infections of Newborn	760–776	140	127	2,814	1,916	0·90	20·1	15·1	2	2	M.	1	113	8	....	18
												F.	....	107	2	....	18
45	Symptoms Referable to Systems or Organs	780–789	1,234	1,230	12,345	11,959	4·63	10·0	9·7	39	38	M.	89	914	126	73	32
												F.	64	877	169	89	31
46	Senility and Ill-Defined Diseases	790–795	143	236	1,854	3,912	1·10	13·0	16·6	42	49	M.	1	81	39	8	14
												F.	4	175	43	4	10
	Total		14,023	18,813	197,852	236,147	82·67	14·1	12·6	38	37		2,976	24,359	3,274	696	1,531

PATIENTS DISCHARGED DURING 1966—*continued*

Item	Disease	International Classification Categories	Number of Cases		Number of Days in Hospital		Per cent. of Grand Total	Average Number Days in Hospital		Average Age of Patients		Sex	* Results				
			Male	Female	Male	Female		Male	Female	Male	Female		1	2	3	4	5
47	Fractures of Face and Skull Bones	N800–N804	272	98	2,996	743	0·71	11·0	7·58	27	21	M.	9	242	5	....	16
												F.	6	86	1	....	5
48	Fractures and Dislocations of Vertebral Column	N805–N806	85	36	4,032	1,493	1·05	47·4	41·5	36	45	M.	1	66	17	....	1
												F	....	29	7	....	....
49	Other Fractures of Trunk, Sternum, Larynx and Pelvis	N807–N809	88	48	2,288	1,093	0·64	26·0	22·8	44	52	M.	4	79	3	....	2
												F.	3	41	3	....	1
50	Fractures of Upper Limb	N810–N819	457	286	2,940	1,594	0·86	6·4	5·6	19	31	M.	12	437	8	....	....
												F.	4	279	2	....	1
51	Fractures of Lower Limb	N820–N829	516	478	15,963	17,885	6·45	30·9	37·4	36	62	M.	30	469	10	....	7
												F.	29	405	18	....	26
52	Dislocation Without Fracture	N830–N839	67	32	953	308	0·24	14·2	9·6	27	32	M.	6	58	2	....	1
												F.	4	26	1	....	1
53	Sprains and Strains	N840–N848	113	39	1,042	289	0·25	9·2	7·4	21	34	M.	6	105	2	....	....
												F.	1	37	1	....	....
54	Head Injury (Excluding Skull Fracture)	N850–N856	1,255	484	7,788	2,591	1·98	6·2	5·4	27	27	M.	45	1,146	38	1	25
												F.	19	453	6	....	6
55	Internal Injury of Chest, Abdomen and Pelvis	N860–N869	53	26	1,118	321	0·27	21·1	12·3	30	24	M.	11	35	3	1	3
												F.	2	20	2	....	2
56	Lacerations, Contusions and Superficial Injuries	N870–N929	763	291	5,298	2,346	1·46	6·9	8·1	23	24	M.	39	705	16	1	2
												F.	13	271	5	....	2
57	Effects of Foreign Body Entering through Orifice	N930–N936	89	92	409	254	0·13	4·6	2·8	25	33	M.	17	64	8	....	....
												F.	28	63	1	....	....
58	Burns	N940–N949	176	109	3,258	2,860	1·17	18·5	26·2	19	21	M.	13	153	1	....	9
												F.	7	99	2	....	1
59	Injury to Nerves and Spinal Cord Without Bone Injury	N950–N959	22	5	1,026	11	0·20	46·6	2·2	38	28	M.	1	17	3	....	1
												F.	....	5	....	....	....
60	Effects of Poisons	N960–N979	275	355	1,284	1,963	0·62	4·7	5·5	19	25	M.	22	241	9	....	3
												F.	25	313	10	....	7
61	Effects of Exposure and Unspecified Injuries and Reactions	N980–N999	97	71	798	680	0·28	8·2	9·6	31	35	M.	9	83	5	....	....
												F.	6	61	4	....	....
	Total (N Categories)		4,328	2,450	51,193	34,431	16·31	11·8	14·1	26	34		372	6,088	193	3	122
62	Investigations, observations and Aftercare	Y00–Y10	213	311	2,811	2,546	1·02	13·2	8·2	33	34	M.	9	146	35	22	1
												F.	14	222	36	38	1
	Total (Y Categories)		213	311	2,811	2,546	1·02	13·2	8·2	33	34		23	368	71	60	2
	Grand Total		18,564	21,574	251,856	273,124	100·00	13·6	12·7	35	37		3,371	30,815	3,538	759	1,655

* Results : 1 — Cured
2 — Improved
3 — Unchanged
4 — Investigation only
5 — Death

OPERATION CASES DISCHARGED, 1966

Item	Operation	Code of Surgical Operations	Number of Cases		Number of Days in Hospital		Per cent. of Total Oper'n Beds	Average Number Days in Hospital		Average Age of Patients		Sex	Results *				
			Male	Female	Male	Female		Male	Female	Male	Female		1	2	3	4	5
1	Neurosurgery, Brain and Cerebral Meninges	001–019	220	135	6,302	3,902	3·84	28·6	28·9	41	44	M.	7	112	61	3	37
												F.	1	75	36	4	19
2	Neurosurgery, Spinal Cord and Spinal Meninges	020–029	97	69	1,703	2,413	1·55	17·6	35·0	41	41	M.	3	54	31	1	8
												F.	2	46	12	1	8
3	Neurosurgery, Peripheral Nerves and Sympathetic System	030–049	56	32	1,175	738	0·72	21·0	23·1	46	43	M.	3	50	3	....	....
												F.	2	22	4	....	4
4	Thyroid and Parathyroid	070–079	10	41	119	641	0·29	11·9	15·6	41	44	M.	2	7	1	....	....
												F.	12	27	1		1
5	Adrenals	080–084	....	4	....	177	0·07	....	44·3	....	59	M.	....	....	....		....
												F.	....	3	....	....	1
6	Pituitary, Thymus and other Endocrine Organs	085–096	6	2	332	30	0·14	55·3	15·0	48	48	M.	....	5	1	....	....
												F.	2	....	....	....	....
7	Ophthalmic Operations	100–199	436	372	5,533	3,948	3·57	12·7	10·6	34	40	M.	19	359	56	1	1
												F.	12	317	42	....	1
8	Ear, Nose and Throat	200–249	542	390	5,742	3,338	3·42	10·6	8·6	28	31	M.	48	445	28	4	17
												F.	30	329	18	4	9
9	Teeth and Gums	250–259	156	192	600	479	0·41	3·8	2·5	19	20	M.	91	63	2	....	....
												F.	125	64	3	....	....
10	Pharynx, Tongue, Palate and Buccal Cavity	260–299	509	556	2,209	2,513	1·78	4·3	4·5	19	22	M.	239	237	26	3	4
												F.	258	265	32	....	1
11	Heart and Pericardium and Intra-Thoracic Great Vessels	300–329	89	117	1,545	2,233	1·42	17·4	19·1	32	31	M.	8	29	43	2	7
												F.	4	52	48	2	11
12	Lung, Bronchus and Mediastinum and Collapse Therapy	330–354	283	112	6,200	2,176	3·16	21·9	19·4	49	44	M.	17	169	79	8	10
												F.	10	60	33	3	6
13	Operations on Breast	380–389	14	129	446	2,013	0·93	31·9	15·6	43	53	M.	4	9	....	1	....
												F.	23	93	10	2	1
14	Operations on Abdominal Wall	400–419	467	293	6,542	5,205	4·43	14·0	17·8	43	51	M.	100	311	19	14	23
												F.	58	160	27	15	33
15	Operations on Stomach	420–439	161	75	3,395	1,675	1·91	21·1	22·3	47	56	M.	23	118	12	2	6
												F.	6	58	4	1	6
16	Operations on Appendix	440–449	423	372	3,228	2,677	2·22	7·6	7·2	23	23	M.	289	131	2	....	1
												F.	251	119	1	....	1
17	Operations on Intestines (Except Appendix and Rectum)	450–469	135	156	3,626	3,993	2·87	26·9	25·6	50	58	M.	15	88	16	2	14
												F.	12	114	17	3	10
18	Operation on Rectum and Anus	470–499	137	117	2,200	2,109	1·62	16·1	18·0	46	52	M.	31	98	5	....	3
												F.	26	87	3	....	1
19	Operation on Liver and Bile Ducts	500–529	116	273	2,458	5,205	2·89	21·2	19·1	55	55	M.	20	74	16	3	3
												F.	91	167	6	....	9
20	Operation on Pancreas	530–539	3	3	43	137	0·07	14·3	45·7	29	49	M.	1	1	1	....	....
												F.	....	3	....	....	
21	Operation on Spleen	540–549	12	14	224	229	0·17	18·7	16·4	25	26	M.	1	10	....	....	1
												F.	2	9	2	....	1

OPERATION CASES DISCHARGED, 1966—*continued*

Item	Operation	Code of Surgical Operations	Number of Cases		Number of Days in Hospital		Per cent. of Total Oper'n Beds	Average Number Days in Hospital		Average Age of Patients		Sex	Results *				
			Male	Female	Male	Female		Male	Female	Male	Female		1	2	3	4	5
22	Operation on Kidney and Ureter	600–639	184	165	4,016	3,420	2·80	21·8	20·7	45	41	M.	17	125	24	16	2
												F.	19	116	19	8	3
23	Operation on Bladder and Urethra	640–669	434	233	6,550	2,740	3·50	15·1	11·8	55	49	M.	26	242	55	98	13
												F.	13	101	46	68	5
24	Operation on Prostrate and Seminal Vesicles	670–679	238	....	7,014	....	2·64	29·5	....	72	....	M.	59	158	6	....	15
												F.	....	....	....	....	....
25	Other Male Genital Organs	680–699	235	....	2,147	....	0·81	9·1	....	20	....	M.	30	197	6	....	2
												F.	....	....	....	....	....
26	On Ovary and Fallopian Tubes	700–719	....	178	....	2,011	0·76	....	11·3	....	32	M.	....	....	....	....	....
												F.	36	122	15	5	....
27	On Uterus and Supporting Structures	720–739	....	869	....	7,737	2·92	....	8·9	...	42	M.	....	....	....	....	....
												F.	105	496	72	196	....
28	On Vagina, Vulva and Perineum	740–759	....	372	....	3,693	1·39	....	9·9	....	46	M.	....	....	....	....	....
												F.	52	260	36	24	....
29	Obstetric Operations (D. and C.)	760–799	....	2,034	....	18,553	6·99	....	9·1	....	25	M.	....	....	....	....	....
												F.	118	1,901	7	7	1
30	Orthopaedic Surgery	800–899	1,718	1,320	32,703	29,741	23·53	19·0	22·5	31	46	M.	103	1,540	56	1	18
												F.	93	1,149	43	1	34
31	On Peripheral Blood Vessels and Lymphatic System	900–929	231	181	4,236	2,820	2·66	18·3	15·6	49	46	M.	10	150	43	4	24
												F.	21	102	39	3	16
32	On Skin and Subcutaneous Tissues	930–949	1,219	702	12,484	8,630	7·95	10·2	12·3	32	36	M.	105	1,079	30	....	5
												F.	78	609	10	1	4
33	Other Surgical Procedures....	950–999	457	493	8,375	9,068	6·57	18·3	18·4	38	44	M.	23	348	47	1	38
												F.	15	398	55	....	25
	Total		8,588	10,001	131,147	134,244	100·00	15·3	13·4	35	38		2,771	13,533	1,310	512	463
			18,589		265,391												

* Operation cases occupied 50·55% of the total bed days. To find the percentage of total beds occupied by the various types of operation cases multiply the percentage figure in column six by the figure 0·505.

* Results :
1 — Cured
2 — Improved
3 — Unchanged
4 — Investigation only
5 — Death

Royal Perth, Princess Margaret, Sir Charles Gairdner, Fremantle and King Edward Memorial Hospitals

ACCIDENTS, POISONINGS AND VIOLENCE, 1966

Accident	Category International Classification "E" Code	Number of Patients	Days in Hospital	Percentage of Hospital Beds Occupied	Average Age of Patients	Number Died
Railway Accidents	800–802	24	872	0·17	42	1
Motor Vehicle Traffic Accidents	810–825	1,901	28,437	5·42	29	43
Motor Vehicle Non-Traffic Accidents	830–835	47	554	0·11	29	....
Other Road Vehicle Accidents	840–845	143	850	0·16	14	....
Water Transport Accidents	850–858	15	209	0·04	32	....
Aircraft Accidents	860–866	5	219	0·04	22	....
Accidental Poisoning	870–895	299	868	0·16	6	....
Accidental Falls	900–904	1,695	27,143	5·17	38	44
Other Accidents	910–936	1,005	10,119	1·93	24	11
Accidents caused by Hot Substances, Corrosive or Steam	917	959	8,508	1·62	23	6
Medical and Surgical Complications and Therapeutic Misadventures	940–959	158	2,128	0·40	44	3
Late Effects of Injury	960–965	96	4,241	0·81	41	1
Suicide and Self-Inflicted Injury	970–979	415	3,674	0·70	35	13
Homicide and Assault	980–985	186	1,104	0·21	34	3
Total		6,948	88,926	16·94	29	125

Derby District Hospital

ALL PATIENTS DISCHARGED, 1966. IN AGE GROUPS

Age Groups	Number of Cases		Per ent. of Total	Total Days Stay in Hospital		Per cent. of Grand Total	Average No. of Days in Hospital	
	Male	Female		Male	Female		Male	Female
00–14	451	365	38·90	3,253	2.468	31·62	7·21	6·76
15–19	77	68	6·92	574	843	7·83	7·45	12·40
20–29	177	217	18·79	1,023	1,972	16·55	5·78	9·09
30–39	132	137	12·83	1,207	1,289	13·80	9·14	9·41
40–49	106	82	8·97	901	735	9·04	8·50	8·96
50–59	85	41	6·01	760	338	6·07	9·00	8·24
60–69	77	27	4·96	1,292	240	8·47	16·78	8·89
70 and over	38	17	2·62	1,044	153	6·62	27·47	9·00
Total	1,143	954	100·00	10,054	8,038	100·00	8·79	8·43
Total Male and Female	2,097			18,092			8·63	

Daily Bed Average : 49·57

Derby District Hospital

OPERATION CASES IN AGE GROUPS, 1966

Age Groups	Number of Cases		Per cent. of Total	Total Days Stay in Hospital		Per cent. of Grand Total	Average No. of Days in Hosptial	
	Male	Female		Male	Female		Male	Female
00–14	15	21	1·72	94	171	1·47	6·27	8·14
15–19	5	13	0·86	125	62	1·03	25·00	4·77
20–29	21	32	2·53	225	236	2·55	10·71	7·38
30–39	12	12	1·14	369	135	2·79	30·75	11·25
40–49	10	18	1·34	84	236	1·77	8·40	13·11
50–59	4	3	0·33	13	13	0·14	3·25	4·33
60–69	2	1	0·14	43	1	0·24	21·50	1·00
70 and over	....	....	....	....	....	....	....	....
Total	69	100	8·06	953	854	9·99	13·81	8·54
Total Male and Female	169			1,807			10·69	

Daily Bed Average : 4·95

PATIENTS DISCHARGED DURING 1966

Item	Disease	International Classification Categories	Number of Cases		Number of Days in Hospital		Per cent. of Grand Total	Average Number of Days in Hospital		Average Age of Patients		Sex	Results*				
			Male	Female	Male	Female		Male	Female	Male	Female		1	2	3	4	5
1	Tuberculosis—All forms	001–019	4	1	14	9	0·13	3·5	9·0	35	2	M.	....	2	2	....	....
												F.	....	1	....	....	....
2	Syphilis, Gonorrhoea and Other Venereal Diseases	020–039	3	1	34	3	0·20	11·3	3·0	28	20	M.	3	....	....	....	....
												F.	....	1	....	....	....
3	Other Infectious Diseases	040–138	132	94	708	745	8·03	5·4	7·9	15	14	M.	56	68	6	....	2
												F.	37	49	6	....	2
4	Malignant Neoplasms, including those of Lymphatic and Haematopiotic Systems	140–205	10	5	338	81	2·32	33·8	16·2	53	37	M.	....	1	7	....	2
												F.	....	2	3	....	....
5	Benign and Unspecified Neoplasms	210–239	2	13	4	154	0·87	2·0	11·8	38	37	M.	1	1	....	....	....
												F.	4	8	1	....	....
6	Allergic Disorders	240–245	8	3	30	10	0·22	3·8	3·3	27	32	M.	4	3	1	....	....
												F.	2	1	....	....	....
7	Diseases of Thyroid Gland	250–254	....	....	....	....	....	....	....	....	....	M.	....	....	....	....	....
												F.	....	....	....	....	....
8	Diabetes Mellitus	260	6	5	80	89	0·93	13·3	17·8	58	53	M.	....	6	....	....	....
												F.	....	4	1	....	....
9	Diseases of other Endocrine Glands	270–277	....	....	....	....	....	....	....	....	....	M.	....	....	....	....	....
												F.	....	....	....	....	....
10	Avitaminoses and other Metabolic Diseases	280–289	8	6	57	69	0·70	7·1	69·0	48	15	M.	3	3	2	....	....
												F.	2	1	1	....	2
11	Diseases of Blood Forming Organs and Blood	290–299	2	8	24	159	1·01	12·0	19·9	3	27	M.	....	2	....	....	....
												F.	....	8		....	....
12	Mental Psychoneurotic and Personality Disorders	300–326	18	8	78	44	0·68	4·3	5·5	41	46	M.	4	10	4	....	....
												F.	1	5	2	....	....
13	Vascular Lesions Affecting Central Nervous System	330–334	3	2	28	5	0·18	9·3	2·5	49	58	M.	....	3	....	....	....
												F.	....	1	....	....	1
14	Inflammatory and other Diseases of Central Nervous System	340–357	11	5	130	228	1·98	11·8	45·6	28	27	M.	2	7	1	....	1
												F.	2	2	....	....	1
15	Diseases of Nerves and Peripheral Ganglia	360–369	3	1	23	8	0·17	7·7	8·0	66	34	M.	....	3	....	....	....
												F.	....	1	....	....	....
16	Diseases of the Eye	370–389	23	15	76	93	0·93	3·3	6·2	30	30	M.	13	9	1	....	....
												F.	4	8	3	....	....
17	Diseases of Ear and Mastoid Process	390–398	16	20	98	118	1·19	6·1	5·9	5	10	M.	7	9	....	....	....
												F.	8	12	....	....	....
18	Rheumatic Fever and Chronic Rheumatic Heart Disease	400–416	2	5	23	155	0·98	11·5	31·0	24	14	M.	....	2	....	....	....
												F.	....	5	....	....	....
19	Diseases of the Heart and Arteries including Hypertension and Arteriosclerosis	420–456	29	6	604	61	3·68	20·8	10·2	55	47	M.	1	25	1	....	2
												F.	1	3	1	....	1
20	Diseases of Veins and other Diseases of Circulatory System	460–468	21	7	152	57	1·16	7·2	8·1	34	37	M.	4	16	1	....	....
												F.	2	5	....	....	....

21	Diseases of Respiratory System	470–527	175	132	1,286	634	10·61	7·3	4·8	20	13	M.	59	109	5	....	2
												F.	40	90	1	....	1
22	Diseases of Buccal Cavity and Oesophagus	530–539	8	9	28	20	0·27	3·5	2·2	17	21	M.	5	3	....	....	....
												F.	6	3	....	....	....
23	Diseases of Stomach and Duodenum	540–545	19	2	120	12	0·73	6·3	6·0	37	57	M.	1	17	1	....	....
												F.	....	2	....	....	....
24	Appendicitis	550–553	3	5	23	69	0·51	7·7	13·8	26	27	M.	2	1	....	....	....
												F.	4	1	....	....	....
25	Hernia of Abdominal Cavity	560–561	8	3	770	29	4·42	96·3	9·7	31	33	M.	4	3	....	....	1
												F.	1	2	....	....	....
26	Other Diseases of Intestines and Peritoneum	570–578	70	59	386	222	3·36	5·5	3·8	10	8	M.	19	49	1	....	1
												F.	22	36	1	....	....
27	Diseases of Liver and Gall Bladder	580–586	3	6	15	80	0·53	5·0	13·3	53	40	M.	....	2	1	....	....
												F.	1	5	....	....	....
28	Diseases of Pancreas	587	....	....	....	....	....	....	....	....	....	M.	....	....	....	....	....
												F.	....	....	....	....	....
29	Nephritis and Nephrosis	590–594	2	1	54	4	0·32	27·0	4·0	5	34	M.	1	1	....	....	....
												F.	....	1	....	....	....
30	Other Diseases of Urinary System	600–609	25	26	340	230	3·15	13·6	8·8	30	26	M.	6	18	1	....	....
												F.	3	22	....	....	1
31	Diseases of Male Genital Organs	610–617	7	....	70	....	0·39	10·0	....	30	....	M.	5	2	....	....	....
												F.	....	....	....	....	....
32	Diseases of Breast	620–621	....	9	....	62	0·34	....	6·9	....	34	M.	....	....	....	....	....
												F.	3	6	....	....	....
33	Diseases of Female Genital Organs, Uterus, Ovary, Fallopian Tubes, Parametrium	622–637	....	39	....	195	1·08	....	5·0	....	29	M.	....	....	....	....	....
												F.	9	27	3	....	....
34	Complications of Pregnancy	640–649	....	58	....	505	2·79	....	8·7	....	26	M.	....	....	....	....	....
												F.	15	36	7	....	....
35	Abortion	650–652	....	28	....	185	1·02	....	6·6	....	26	M.	....	....	....	....	....
												F.	20	8	....	....	....
36	Delivery without Mention of Complication	660	....	102	....	1,618	8·94	....	15·9	....	26	M.	....	....	....	....	....
												F.	68	34	....	....	....
37	Delivery with Specified Complication	670–678	....	22	....	319	1·76	....	14·5	....	25	M.	....	....	....	....	....
												F.	6	16	....	....	....
38	Complications of the Puerperium	680–689	....	3	....	20	0·11	....	6·7	....	31	M.	....	....	....	....	....
												F.	1	2	....	....	....
39	Diseases of Skin and Cellular Tissue	690–716	124	65	648	492	6·30	5·2	7·6	23	25	M.	54	69	1	....	....
												F.	26	38	1	....	....
40	Arthritis and Rheumatism Except Rheumatic Fever	720–727	4	3	70	17	0·48	17·5	5·7	38	53	M.	1	3	....	....	....
												F.	....	3	....	....	....
41	Osteomyelitis and other Bone and Joint Diseases	730–738	25	5	282	53	1·85	11·3	10·6	30	18	M.	6	16	3	....	....
												F.	2	3	....	....	....
42	Other Diseases of Musculoskeletal System	740–749	10	4	119	18	0·76	11·9	4·5	32	21	M.	4	6	....	....	....
												F.	3	1	....	....	....
43	Congenital Malformations	750–759	3	2	17	49	0·36	5·7	24·5	3	8	M.	....	....	3	....	....
												F.	....	1	1	....	....
44	Birth Injuries, Asphyxia and Infections of Newborn	760–776	10	7	112	145	1·42	11·2	20·7	1	1	M.	3	5	....	....	2
												F.	5	1	1	....	....
45	Symptoms Referable to Systems or Organs	780–789	51	47	333	209	3·00	6·5	4·4	29	18	M.	11	34	5	....	1
												F.	11	29	7	....	....
46	(Senility) and Ill-Defined Diseases	790–795	21	8	154	63	1·20	7·3	7·9	31	47	M.	3	10	8	....	....
												F.	2	4	2	....	
	Total		869	850	7,328	7,338	81·06	8·4	8·6	24	22		593	1,006	97	....	23

PATIENTS DISCHARGED DURING 1966 *continued*

Item	Disease	International Classification Categories	Number of Cases		Number of Days in Hospital		Per cent. of Grand Total	Average Number Days in Hospital		Average Age of Patients		Sex	Results*				
			Male	Female	Male	Female		Male	Female	Male	Female		1	2	3	4	5
47	Fractures of Face and Skull Bones	N800–N804	14	3	201	29	1·27	14·4	9·7	37	12	M.	2	11	....	....	1
												F.	....	3	....	....	....
48	Fractures and Dislocations of Vertebral Column	N805–N806	10	1	80	2	0·45	8·0	2·0	23	24	M.	2	8	....	....	....
												F.	1	....	....	....	....
49	Other Fractures of Trunk, Sternum, Larynx and Pelvis	N807–N809	3	1	47	3	0·28	15·7	3·0	40	14	M.	....	3	....	....	...
												F.	....	1	....	....	....
50	Fractures of Upper Limb	N810–N819	41	7	365	23	2·14	8·9	3·3	25	20	M.	11	27	3	....	....
												F.	....	7	....	....	....
51	Fractures of Lower Limb	N820–N829	23	3	963	27	5·47	41·9	9·0	21	39	M.	6	16	1	....	....
												F.	....	3	....	....	....
52	Dislocation Without Fracture	N830–N839	2	1	7	11	0·10	3·5	11·0	39	16	M.	1	1	....	....	....
												F.	1	....	....	....	....
53	Sprains and Strains	N840–N848	13	8	72	82	0·85	5·5	10·3	33	35	M.	6	7	....	....	....
												F.	2	5	1	....	....
54	Head Injury (Excluding Skull Fracture.)	N850–N856	23	12	70	37	0·59	3·0	3·1	23	23	M.	10	12	1	....	...
												F.	6	6	....	....	....
55	Internal Injury of Chest, Abdomen and Pelvis	N860–N869	4	1	50	7	0·32	12·5	7·0	34	43	M.	4	....	....	....	....
												F.	1	....	....	....	....
56	Lacerations, Contusions and Superficial Injuries	N870–N929	80	26	612	123	4·06	7·7	4·7	27	15	M.	33	46	1	....	....
												F.	8	17	1	....	....
57	Effects of Foreign Body Entering Through Orifice	N930–N936	14	2	38	3	0·23	2·7	1·5	30	3	M.	9	5	....	....	....
												F.	....	2	....	....	....
58	Burns	N940–N949	16	8	96	174	1·49	6·0	21·8	24	21	M.	7	9	....	....	....
												F.	3	5	....	....	....
59	Injury to Nerves and Spinal Cord Without Bone Injury	N950–N959	....	....	....	....	....	....	....	....	....	M.	....	....	....	....	....
												F.	....	....	....	....	....
60	Effects of Poisons	N960–N979	14	11	51	17	0·38	3·6	1·5	14	10	M.	7	7	....	....	....
												F.	3	8	....	....	....
61	Effects of Exposure and Unspecified Injuries and Reactions	N980–N999	9	5	23	20	0·24	2·6	4·0	26	33	M.	4	5	....	....	....
												F.	3	2	....	....	....
	Total (N Categories)		266	89	2,675	558	17·87	10·1	6·3	26	20		130	216	8	....	1
62	Investigations, Observations and Aftercare	Y00–Y10	8	15	51	142	1·07	6·4	9·5	21	10	M.	2	6	....	....	....
												F.	1	13	1	....	....
	Total (Y Categories)		8	15	51	142	1·07	6·4	9·5	21	10		3	19	1	....	....
	Grand Total		1,143	954	10,054	8.038	100·00	8·8	8·4	24	21		726	1.241	106	....	24

* Results : 1 — Cured
2 — Improved
3 — Unchanged
4 — Investigation only
5 — Death

Derby District Hospital

OPERATION CASES DISCHARGED, 1966

Item	Operation	Code of Surgical Operations	Number of Cases		Number of Days in Hospital		Per cent. of Total Oper'n Beds	Average Number Days in Hospital		Average Age of Patients		Sex	Results*				
			Male	Female	Male	Female		Male	Female	Male	Female		1	2	3	4	5
1	Neurosurgery, Brain and Cerebral Meninges	001–019	....	1	....	18	1·00	....	18·0	....	6	M.	....	....	....	....	....
												F.	....	1	....	....	....
2	Neurosurgery, Spinal Cord and Spinal Meninges	020–029	....	....	....	....	....	....	....	....	....	M.	....	....	....	....	....
												F.	....	....	....	....	....
3	Neurosurgery. Peripheral Nerves and Sympathetic System	030–049	....	1	....	4	0·22	....	4·0	....	20	M.	....	....	....	....	....
												F.	1	....	....	....	....
4	Thyroid and Parathyroid	070–079	....	....	....	....	....	....	....	....	....	M.	....	....	....	....	....
												F.	....	....	....	....	....
5	Adrenals	080–084	....	....	....	....	....	....	....	....	....	M.	....	....	....	....	....
												F.	....	....	....	....	....
6	Pituitary, Thymus and Other Endocrine Organs	085–096	....	....	....	....	....	....	....	....	....	M.	....	....	....	....	....
												F.	....	....	....	....	....
7	Ophthalmic Operations	100–199	6	7	19	85	5·76	3·2	12·1	37	37	M.	2	4	....	....	....
												F.	1	6	....	....	....
8	Ear, Nose and Throat	200–249	2	2	12	3	0·83	6·0	1·5	3	3	M.	1	1	....	....	....
												F.	....	2	....	....	....
9	Teeth and Gums	250–259	....	2	....	4	0·22	....	2·0	....	14	M.	....	....	....	....	....
												F.	2	....	....	....	....
10	Pharynx, Tongue, Palate and Buccal Cavity	260–299	2	2	10	8	1·00	5·0	4·0	8	7	M.	1	1	....	....	....
												F.	2	....	....	....	....
11	Heart and Pericardium and Intrathoracic Vessels	300–329	....	....	....	....	....	....	....	....	....	M.	....	....	....	....	....
												F.	....	....	....	....	....
12	Lung. Bronchus and Mediastinum and Collapse Therapy	330–354	....	....	....	....	....	....	....	....	....	M.	....	....	....	....	....
												F.	....	....	....	....	....
13	Operations on Breast	380–389	....	....	....	....	....	....	....	....	....	M.	....	....	....	....	....
												F.	....	....	....	....	....
14	Operations on Abdominal Wall	400–419	6	3	71	29	5·53	11·8	9·7	24	33	M.	4	2	....	....	....
												F.	1	2	....	....	....
15	Operations on Stomach	420–439	2	....	6	....	0·33	3·0	....	46	....	M.	....	2	....	....	....
												F.	....	....	....	....	....
16	Operations on Appendix	440–449	4	6	32	77	6·03	8·0	12·8	31	25	M.	2	2	....	....	....
												F.	5	1	....	....	....
17	Operations on Intestines (Except Appendix and Rectum)	450–469	....	....	....	....	....	....	....	....	....	M.	....	....	....	....	....
												F.	....	....	....	....	....
18	Operation on Rectum and Anus	470–499	4	1	38	13	2·82	9·5	13·0	31	33	M.	2	2	....	....	....
												F.	1	....	....	....	....
19	Operation on Liver and Bile Ducts	500–529	....	1	....	14	0·77	....	14·0	....	40	M.	....	....	....	....	....
												F.	....	1	....	....	....
20	Operation on Pancreas	530–539	....	....	....	....	....	....	....	....	....	M.	....	....	....	....	....
												F.	....	....	....	....	....
21	Operation on Spleen	540–549	....	....	....	....	....	....	....	....	....	M.	....	....	....	....	....
												F.	....	....	....	....	....

OPERATION CASES DISCHARGED, 1966—*continued*

Item	Operation	Code of Surgical Operations	Number of Cases		Number of Days in Hospital		Per cent. of Total Oper'n Beds	Average Number Days in Hospital		Average Age of Patients		Sex	Results*				
			Male	Female	Male	Female		Male	Female	Male	Female		1	2	3	4	5
22	Operation on Kidney and Ureter	600–639	1	1	10	1	0·61	10·0	1·0	28	29	M.	....	....	1	....	....
												F.	....	1	....	....	....
23	Operation on Bladder and Urethra	640–669	2	....	37	....	2·05	18·5	....	46	....	M.	....	2	....	....	....
												F.	....	....	....	....	....
24	Operation on Prostate and Seminal Vesicles	670–679	1	....	11	....	0·61	11·0	....	64	....	M.	1	....	....	....	....
												F.	....	....	....	....	....
25	Other Male Genital Organs	680–699	2	....	33	....	1·83	16·5	....	22	....	M.	2	....	....	....	....
												F.	....	....	....	....	....
26	On Ovary and Fallopian Tubes	700–719	....	2	....	25	1·38	....	12·5	....	34	M.	....	....	....	....	....
												F.	....	2	....	....	....
27	On Uterus and Supporting Structures	720–739	....	22	....	130	7·20	....	5·9	....	30	M.	....	....	....	....	....
												F.	9	11	2	....	....
28	On Vagina, Vulva and Perineum	740–759	....	....	....	....	....	....	....	....	....	M.	....	....	....	....	....
												F.	....	....	....	....	....
29	Obstetric Operations (D and C)	760–799	....	17	....	144	7·97	....	8·5	....	27	M.	....	....	....	....	....
												F.	5	12	....	....	....
30	Orthopaedic Surgery	800–899	21	9	515	94	33·70	24·5	10·4	27	25	M.	6	15	....	....	....
												F.	5	3	1	....	....
31	On Peripheral Blood Vessels and Lymphatic System	900–929	1	1	14	10	1·33	14·0	10·0	25	39	M.	1	....	....	....	....
												F.	1	....	....	....	....
32	On Skin and Subcutaneous Tissues	930–949	14	22	105	195	16·60	7·5	8·9	23	20	M.	6	7	....	....	1
												F.	10	12	....	....	....
33	Other Surgical Procedures	950–999	1	....	40	....	2·21	40·0	....	20	....	M.	....	1	....	....	....
												F.	....	....	....	....	....
	Total		69	100	953	854	100·00	13·8	8·5	28	26		71	93	4	....	1
			169		1,807												

Operation cases occupied 9·99 per cent. of the total bed days. To find the percentage of total beds occupied by the various types of operation cases multiply the percentage figure in column 6 by the figure 0·999.

* Results : 1 — Cured
2 — Improved
3 — Unchanged
4 — Investigation only
5 — Death

Derby District Hospital

ALL PATIENTS DISCHARGED, 1966. IN AGE GROUPS

Age Groups	Number of Cases		Percent. of Total	Total Days Stay in Hospital		Per cent. of Grand Total	Average No. of Days in Hospital	
	White	Aboriginal		White	Aboriginal		White	Aboriginal
00–14	183	633	38·90	660	5,061	31·62	3·61	7·99
15–19	58	87	6·92	315	1,102	7·83	5·43	12·67
20–29	234	160	18·79	1,220	1,775	16·55	5·21	11·09
30–39	145	124	12·83	1,016	1,480	13·80	7·01	11·94
40–49	105	83	8·97	701	935	9·04	6·68	11·27
50–59	80	46	6·01	516	582	6·07	6·45	12·65
60–69	48	56	4·96	784	748	8·47	16·33	13·36
70 and over	9	46	2·62	796	401	6·62	88·44	8·72
Total	862	1,235	100·00	6,008	12,084	100·00	6·97	9·78
Total white and aboriginal	2,097			18,092			8·63	

Daily bed Average—49·57

Derby District Hospital

OPERATION CASES IN AGE GROUPS. 1966

Age Groups	Number of Cases		Per cent. of Total	Total Days Stay in Hospital		Per cent. of Grand Total	Average No. of Days in Hosptial	
	White	Aboriginal		White	Aboriginal		White	Aboriginal
00–14	17	19	1·72	80	185	1·47	4·71	9·74
15–19	9	9	0·87	75	112	1·03	8·33	12·44
20–29	35	18	2·52	216	245	2·55	6·17	13·61
30–39	14	10	1·14	368	136	2·78	26·29	13·60
40–49	13	15	1·34	115	205	1·77	8·85	13·67
50–59	7	....	0·33	26	....	0·15	3·71	....
60–69	2	1	0·14	12	32	0·24	6·00	32·00
70 and over	....	....	....	....	....	....	....	....
Total	97	72	8·06	892	915	9·99	9·20	12·71
Total white and aboriginal	169			1,807			10·69	

Daily Bed Average—4·95

PATIENTS DISCHARGED DURING 1966

Item	Disease	International Classification Categories	Number of Cases		Number of Days in Hospital		Per cent. of Grand Total	Average Number of Days in Hospital		Average Age of Patients		Race	Results*				
			White	Abor-iginal	White	Abor-iginal		White	Abor-iginal	White	Abor-iginal		1	2	3	4	5
1	Tuberculosis—All forms	001–019	2	3	8	15	0·13	4·0	5·0	35	23	W.	....	....	2	....	....
												A.	....	3	....	....	....
2	Syphilis, Gonorrhoea and Other Venereal Diseases	020–039	....	4	....	37	0·20	....	9·3	....	26	W.	....	....	....	....	....
												A.	3	1	....	....	....
3	Other Infectious Diseases	040–138	77	149	315	1,138	8·03	4·1	7·6	22	10	W.	41	31	4	....	1
												A.	52	86	8	....	3
4	Malignant Neoplasms, including those of Lymphatic and Haematopoitic Systems	140–205	5	10	286	133	2·32	57·2	13·3	51	46	W.	....	....	4	....	1
												A.	....	3	6	....	1
5	Benign and Unspecified Neoplasms	210–239	12	3	80	78	0·87	6·7	26·0	36	41	W.	4	8	....	....	....
												A.	1	1	1	....	....
6	Allergic Disorders	240–245	8	3	26	14	0·22	3·3	4·7	38	5	W.	5	2	1	....	....
												A.	1	2	....	....	....
7	Diseases of Thyroid Gland	250–254	....	....	....	....	....	....	....	....	....	W.	....	....	....	....	....
												A.	....	....	....	....	....
8	Diabetes Mellitus	260	2	9	12	157	0·93	6·0	17·4	56	56	W.	....	2	....	....	....
												A.	....	8	1	....	....
9	Diseases of other Endocrine Glands	270–277	....	....	....	....	....	....	....	....	....	W.	....	....	....	....	....
												A.	....	....	....	....	....
10	Avitaminoses and other Metabolic Diseases	280–289	5	9	13	113	0·70	2·6	12·6	47	26	W.	2	3	....	....	....
												A.	3	1	3	....	2
11	Diseases of Blood Forming Organs and Blood	290–299	1	9	5	178	1·01	5·0	19·8	26	21	W.	....	1	....	....	....
												A.	....	9	....	....	....
12	Mental Psychoneurotic and Personality Disorders	300–326	18	8	89	33	0·68	4·9	4·1	43	42	W.	2	10	6	....	....
												A.	3	5	....	....	....
13	Vascular Lesions Affecting Central Nervous System	330–334	2	3	12	21	0·18	6·0	7·0	59	48	W.	....	2	....	....	....
												A.	....	2	....	....	1
14	Inflammatory and other Diseases of Central Nervous System	340–357	6	10	78	280	1·98	13·0	28·0	46	16	W.	1	4	1	....	....
												A.	3	5	....	....	2
15	Diseases of Nerves and Peripheral Ganglia	360–369	4	....	31	....	0·17	7·8	....	58	....	W.	....	4	....	....	....
												A.	....	....	....	....	....
16	Diseases of the Eye	370–389	16	22	56	113	0·93	3·5	5·1	32	28	W.	9	6	1	....	....
												A.	8	11	3	....	....
17	Diseases of Ear and Mastoid Process	390–398	8	28	52	164	1·19	6·5	5·9	20	5	W.	3	5	....	....	....
												A.	12	16	....	....	....
18	Rheumatic Fever and Chronic Rheumatic Heart Disease	400–416	2	5	23	155	0·98	11·5	31·0	24	14	W.	....	2	....	....	....
												A.	....	5	....	....	....
19	Diseases of the Heart and Arteries including Hypertension and Arteriosclerosis	420–456	12	23	217	448	3·68	18·1	19·5	50	55	W.	1	11	....	....	....
												A.	1	17	2	....	3
20	Diseases of Veins and other Diseases of Circulatory System	460–468	24	4	191	18	1·16	8·0	4·5	39	5	W.	5	18	1	....	....
												A.	1	3	....	....	....
21	Diseases of Respiratory System	470–527	77	230	537	1,383	10·61	7·0	6·0	26	14	W.	32	42	2	....	1
												A.	67	157	4	....	2
22	Diseases of Buccal Cavity and Oesophagus	530–539	9	8	17	31	0·27	1·9	3·9	21	17	W.	5	4	....	....	....
												A.	6	2	....	....	....
23	Diseases of Stomach and Duodenum	540–545	16	5	82	50	0·73	5·1	10·0	42	20	W.	1	14	1	....	....
												A.	....	5	....	....	....

PATIENTS DISCHARGED DURING 1966—*continued*

Item	Disease	International Classification Categories	Number of Cases		Number of Days in Hospital		Per cent. of Grand Total	Average Number of Days in Hospital		Average Age of Patients		Race	Results*				
			White	Abor-iginal	White	Abor-iginal		White	Abor-iginal	White	Abor-iginal		1	2	3	4	5
24	Appendicitis	550–553	4	4	32	60	0·51	8·0	15·0	31	23	W.	3	1	....	....	....
												A.	3	1	....	....	....
25	Hernia of Abdominal Cavity	560–561	7	4	756	43	4·42	108·0	10·8	28	37	W.	4	2	....	....	1
												A.	1	3	....	....	....
26	Other Diseases of Intestines and Peritoneum	570–578	37	92	113	495	3·36	3·1	5·4	23	4	W.	11	24	1	....	1
												A.	30	61	1	....	....
27	Diseases of Liver and Gall Bladder	580–586	4	5	21	74	0·53	5·3	14·8	44	45	W.	....	3	1	....	....
												A.	1	4	....	....	....
28	Diseases of Pancreas	587	....	....	....	....	....	....	....	....	....	W.	....	....	....	....	....
												A.	....	....	....	....	....
29	Nephritis and Nephrosis	590–594	1	2	11	47	0·32	11·0	23·5	6	19	W.	....	1	....	....	....
												A.	1	1	....	....	....
30	Other Diseases of Urinary System	600–609	14	37	61	509	3·15	4·4	13·8	36	25	W.	4	9	1	....	....
												A.	5	31	....	....	1
31	Diseases of Male Genital Organs	610–617	3	4	24	46	0·39	8·0	11·5	32	28	W.	3	....	....	....	....
												A.	2	2	....	....	....
32	Diseases of Breast	620–621	1	8	2	60	0·34	2·0	7·5	22	36	W.	1	....	....	....	....
												A.	2	6	....	....	....
33	Diseases of Female Genital Organs, Uterus, Ovary, Fallopian Tubes, Parametrium	622–637	26	13	147	48	1·08	5·7	3·7	29	27	W.	7	17	2	....	....
												A.	2	10	1	....	....
34	Complications of Pregnancy	640–649	20	38	106	399	2·79	5·3	10·5	30	24	W.	7	12	1	....	....
												A.	8	24	6	....	....
35	Abortion	650–652	14	14	84	101	1·02	6·0	7·2	24	27	W.	9	5	....	....	....
												A.	11	3	....	....	....
36	Delivery without Mention of Complication	660	38	64	363	1,255	8·94	9·6	19·6	26	27	W.	30	8	....	....	....
												A.	38	26	....	....	....
37	Delivery with Specified Complication	670–678	2	20	22	297	1·76	11·0	14·9	27	25	W.	1	1	....	....	....
												A.	5	15	....	....	....
38	Complications of the Puerperium	680–689	....	3	....	20	0·11	....	6·7	....	31	W.	....	....	....	....	....
												A.	1	2	....	....	....
39	Diseases of Skin and Cellular Tissue	690–716	104	85	434	706	6·30	4·2	8·3	29	17	W.	50	52	2	....	....
												A.	30	55	....	....	....
40	Arthritis and Rheumatism Except Rheumatic Fever	720–727	4	3	61	26	0·48	15·3	8·7	33	60	W.	1	3	....	....	....
												A.	....	3	....	....	....
41	Osteomyelitis and other Bone and Joint Diseases	730–738	14	16	76	259	1·85	5·4	16·2	35	21	W.	4	8	2	....	....
												A.	4	11	1	....	....
42	Other Diseases of Musculoskeletal System	740–749	8	6	47	90	0·76	5·9	15·0	26	31	W.	5	3	....	....	....
												A.	2	4	....	....	....
43	Congenital Malformations	750–759	....	5	....	66	0·36	....	13·2	....	5	W.	....	....	....	....	....
												A.	....	1	4	....	....
44	Birth Injuries, Asphyxia and Infections of Newborn	760–776	2	15	58	199	1·42	29·0	13·3	1	1	W.	....	....	1	....	1
												A.	8	6	....	....	1
45	Symptoms Referable to Systems or Organs	780–789	48	50	142	400	3·00	3·0	8·0	27	21	W.	9	30	8	....	1
												A.	13	33	4	...	....
46	(Senility) and Ill-Defined Diseases	790–795	14	15	76	141	1·20	5·4	9·4	31	39	W.	3	5	6	....	....
												A.	2	9	4	....	....
	Total		671	1,048	4,766	9,900	81·06	7·1	9·4	30	18		593	1,006	97	....	23

PATIENTS DISCHARGED DURING 1966—*continued*

Item	Disease	International Classification Categories	Number of Cases		Number of Days in Hospital		Per cent. of Grand Total	Average Number Days in Hospital		Average Age of Patients		Race	Results*				
			White	Abor-iginal	White	Abor-iginal		White	Abor-iginal	White	Abor-iginal		1	2	3	4	5
47	Fractures of Face and Skull Bones	N800–N804	11	6	120	110	1·27	10·9	18·3	35	27	W.	....	10	....	....	1
												A.	2	4	....	....	....
48	Fractures and Dislocations of Vertebral Column	N805–N806	4	7	34	48	0·45	8·5	6·9	17	27	W.	1	3	....	....	....
												A.	2	5	....	....	....
49	Other Fractures of Trunk, Sternum, Larynx and Pelvis	N807–N809	2	2	5	45	0·28	2·5	22·5	43	25	W.	....	2	....	....	....
												A.	....	2	....	....	....
50	Fractures of Upper Limb	N810–N819	24	24	149	239	2·14	6·2	10·0	29	19	W.	5	18	1	....	....
												A.	6	16	2	....	....
51	Fractures of Lower Limb	N820–N829	13	13	340	650	5·47	26·2	50·0	32	15	W.	4	8	1	....	....
												A.	2	11	....	....	....
52	Dislocation Without Fracture	N830–N839	2	1	7	11	0·10	3·5	11·0	39	16	W.	1	1	....	....	....
												A.	1	....	....	....	....
53	Sprains and Strains	N840–N848	14	7	81	73	0·85	5·8	10·4	34	32	W.	7	7	....	....	....
												A.	1	5	1	....	....
54	Head Injury (Excluding Skull Fracture)	N850–N856	16	19	47	60	0·59	2·9	3·2	21	25	W.	3	12	1	....	....
												A.	13	6	....	....	....
55	Internal Injury of Chest, Abdomen and Pelvis	N860–N869	5	....	57	....	0·32	11·4	....	36	....	W.	5	....	....	....	....
												A.	....	....	....	....	....
56	Lacerations, Contusions and Superficial Injuries	N870–N929	56	50	283	452	4·06	5·1	9·0	25	22	W.	20	34	2	....	....
												A.	21	29	....	....	....
57	Effects of Foreign Body Entering Through Orifice	N930–N936	14	2	33	8	0·23	2·4	4·0	29	11	W.	8	6	....	....	....
												A.	1	1	....	....	....
58	Burns	N940–N949	11	13	33	237	1·49	3·0	18·2	30	18	W.	7	4	....	....	....
												A.	3	10	....	....	....
59	Injury to Nerves and Spinal Cord Without Bone Injury	N950–N959	....	....	....	....	....	....	....	....	....	W.	....	....	....	....	....
												A.	....	....	....	....	....
60	Effects of Poisons	N960–N979	9	16	10	58	0·38	1·1	3·6	20	8	W.	4	5	....	....	....
												A.	6	10	....	....	....
61	Effects of Exposure and Unspecified Injuries and Reactions	N980–N999	8	6	20	23	0·24	2·5	3·8	25	32	W.	3	5	....	....	....
												A.	4	2	....	....	....
	Total (N Categories)		189	166	1,219	2,014	17·87	6·4	12·1	28	21		130	216	8	....	1
62	Investigations, Observations and Aftercare	Y00–Y10	2	21	23	170	1·07	11·5	8·1	37	12	W.	....	2	....	....	....
												A.	3	17	1	....	....
	Total (Y Categories)		2	21	23	170	1·07	11·5	8·1	37	12		3	19	1	....	....
	Grand Total		862	1,235	6,008	12,084	100·00	7·0	9·8	29	19		726	1,241	106	....	24

* Results : 1 — Cured
2 — Improved
3 — Unchanged
4 — Investigation only
5 — Death

Derby District Hospital

OPERATION CASES DISCHARGED, 1966

Item	Operation	Code of Surgical Operations	Number of Cases		Number of Days in Hospital		Per cent. of Total Oper'n Beds	Average Number Days in Hospital		Average Age of Patients		Race	Results*				
			White	Aboriginal	White	Aboriginal		White	Aboriginal	White	Aboriginal		1	2	3	4	5
1	Neurosurgery, Brain and Cerebral Meninges	001–019	....	1	....	18	1·00	....	18·0	....	6	W.	....	....	....	....	....
												A.	....	1	....	....	....
2	Neurosurgery, Spinal Cord and Spinal Meninges	020–029	....	....	....	....	....	....	....	....	....	W.	....	....	....	....	....
												A.	....	....	....	....	....
3	Neurosurgery. Peripheral Nerves and Sympathetic System	030–049	1	....	4	....	0·22	4·0	....	20	....	W.	1	....	....	....	....
												A.	....	....	....	....	....
4	Thyroid and Parathyroid	070–079	....	....	....	....	....	....	....	....	....	W.	....	....	....	....	....
												A.	....	....	....	....	....
5	Adrenals	080–084	....	....	....	....	....	....	....	....	....	W.	....	....	....	....	....
												A.	....	....	....	....	....
6	Pituitary, Thymus and Other Endocrine Organs	085–096	....	....	....	....	....	....	....	....	....	W.	....	....	....	....	....
												A.	....	....	....	....	....
7	Ophthalmic Operations	100–199	7	6	33	71	5·76	4·7	11·8	36	38	W.	2	5	....	....	....
												A.	1	5	....	....	....
8	Ear, Nose and Throat	200–249	3	1	9	6	0·83	3·0	6·0	3	4	W.	1	2	....	....	....
												A.	....	1	....	....	....
9	Teeth and Gums	250–259	1	1	2	2	0·22	2·0	2·0	22	5	W.	1	....	....	....	....
												A.	1	....	....	....	....
10	Pharynx, Tongue, Palate and Buccal Cavity	260–299	2	2	12	6	1·00	6·0	3·0	11	4	W.	2	....	....	....	....
												A.	1	1	....	....	....
11	Heart and Pericardium and Intrathoracic Great Vessels	300–329	....	....	....	....	....	....	....	....	....	W.	....	....	....	....	....
												A.	....	....	....	....	....
12	Lung, Bronchus and Mediastinum and Collapse Therapy	330–354	....	....	....	....	....	....	....	....	....	W.	....	....	....	....	....
												A.	....	....	....	....	....
13	Operations on Breast	380–389	....	....	....	....	....	....	....	....	....	W.	....	....	....	....	....
												A.	....	....	....	....	....
14	Operations on Abdominal Wall	400–419	4	5	41	59	5·53	10·3	11·8	19	34	W.	3	1	....	....	....
												A.	2	3	....	....	....
15	Operations on Stomach	420–439	2	....	6	....	0·33	3·0	....	46	....	W.	....	2	....	....	....
												A.	....	....	....	....	....
16	Operations on Appendix	440–449	5	5	41	68	6·03	8·2	13·6	34	22	W.	3	2	....	....	....
												A.	4	1	....	....	....
17	Operations on Intestines (Except Appendix and Rectum)	450–469	....	....	....	....	....	....	....	....	....	W.	....	....	....	....	....
												A.	....	....	....	....	....
18	Operation on Rectum and Anus	470–499	5	....	51	....	2·82	10·2	....	31	....	W.	3	2	....	....	....
												A.	....	....	....	....	....
19	Operations on Liver and Bile Ducts	500–529	1	....	14	....	0·77	14·0	....	40	....	W.	....	1	....	....	....
												A.	....	....	....	....	....
20	Operation on Pancreas	530–539	....	....	....	....	....	....	....	....	....	W.	....	....	....	....	....
												A.	....	....	....	....	....
21	Operation on Spleen	540–549	....	....	....	....	....	....	....	....	....	W.	....	....	....	....	....
												A.	....	....	....	....	....

Derby District Hospital

OPERATION CASES DISCHARGED, 1966—*continued*

Item	Operation	Code of Surgical Operations	Number of Cases		Number of Days in Hospital		Per cent. of Total Oper'n Beds	Average Number Days in Hospital		Average Age of Patients		Race	Results*				
			White	Abor-iginal	White	Abor-iginal		White	Abor-iginal	White	Abor-iginal		1	2	3	4	5
22	Operation on Kidney and Ureter	600–639	2	....	11	....	0·61	5·5	....	29	....	W.	....	1	1	....	....
												A.	....	....	....	....	....
23	Operation on Bladder and Urethra	640–669	....	2	....	37	2·05	....	18·5	....	46	W.	....	....	....	....	....
												A.	....	2	....	....	....
24	Operation on Prostrate and Seminal Vesicles	670–679	1	....	11	....	0·61	11·0	....	64	....	W.	1	....	....	....	....
												A.	....	....	....	....	....
25	Other Male Genital Organs	680–699	2	....	33	....	1·83	16·5	....	22	....	W.	2	....	....	....	....
												A.	....	....	....	....	....
26	On Ovary and Fallopian Tubes	700–719	1	1	2	23	1·38	2·0	23·0	27	41	W.	....	1	....	....	....
												A.	....	1	....	....	....
27	On Uterus and Supporting Structures	720–739	19	3	106	24	7·20	5·6	8·0	31	25	W.	7	10	2	....	....
												A.	2	1	....	....	....
28	On Vagina, Vulva and Perineum	740–759	....	....	....	....	....	....	....	....	....	W.	....	....	....	....	....
												A.	....	....	....	....	....
29	Obstetric Operations (D and C)	760–799	7	10	49	95	7·97	7·0	9·5	29	25	W.	....	7	....	....	....
												A.	5	5	....	....	....
30	Orthopaedic Surgery	800–899	13	17	346	263	33·70	26·6	15·5	28	26	W.	6	7	....	....	....
												A.	5	11	1	....	....
31	On Peripheral Blood Vessels and Lymphatic System	900–929	2	....	24	....	1·33	12·0	....	32	....	W.	2	....	....	....	....
												A.	....	....	....	....	....
32	On Skin and Subcutaneous Tissues	930–949	18	18	57	243	16·60	3·2	13·5	23	20	W.	10	7	....	....	1
												A.	6	12	....	....	....
33	Other Surgical Procedures	950–999	1	....	40	....	2·21	40·0	....	20	....	W.	....	1	....	....	....
												A.	....	....	....	....	....
	Total		97	72	892	915	100·00	9·2	12·7	28	25		71	93	4	....	1
			169		1,807												

Operation cases occupied 9·99 per cent. of the total bed days. To find the percentage of total beds occupied by the various types of operation cases multiply the percentage figure in column 6 by the figure 0·999.

* Results : 1 — Cured
2 — Improved
3 — Unchanged
4 — Investigation only
5 — Death

Derby District Hospital

ACCIDENTS, POISONINGS, VIOLENCE, 1966

Accident	Category International Classification "E" Code	Number of Patients	Days in Hospital	Percentage of Hospital Beds Occupied	Average Age of Patients	Number Died
Railway Accidents	800–802	....	....	....	....	....
Motor Vehicle Traffic Accidents	810–825	18	715	3·95	25	....
Motor Vehicle Non-Traffic Accidents	830–835	3	26	0·14	38	....
Other Road Vehicle Accidents	840–845	12	122	0·67	29	1
Water Transport Accidents	850–858	2	2	0·01	17	....
Aircraft Accidents	860–866	....	....	....	....	....
Accidental Poisoning	870–895	9	18	0·10	5	....
Accidental Falls	900–904	103	1,072	5·93	26	....
Other Accidents	910–936	24	134	0·74	26	....
Accidents caused by Hot Substances, Corrosive or Steam	917	172	1,011	5·59	23	....
Medical and Surgical Complications and Therapeutic Misadventures	940–959	1	5	0·03	1	....
Late Effects of Injury	960–965	....	....	....	....	....
Suicide and Self-inflicted Injury	970–979	3	8	0·04	16	....
Homicide and Assault	980–985	13	70	0·39	33	....
Total		360	3,183	17·59	24	1

Appendix XVII

Derby Leprosarium, Western Australia

Admissions and Discharges for the Year 1966, compiled from the Monthly Returns of the Superintendent

Month	Admissions							Discharges											Inmates Remaining in Leprosarium		
	Males			Females				Males					Females								
	Ad-mitted	Re-Ad-mitted	Total Males	Ad-mitted	Re-Ad-mitted	Total Females	Total Ad-mitted	Dis-charged Cured	De-ceased	Ab-sconded	Dis-charged Non-In-fectious	Total Males Dis-charged	Dis-charged Cured	De-ceased	Ab-sconded	Dis-charged Non-In-fectious	Total Females Dis-charged	Total Dis-charged	Males	Females	Total Remain-ing
January	....	....	....	....	....	....	....	....	1	....	....	1	....	....	....	....	....	1	100	77	177
February	....	2	2	....	....	....	2	2	....	....	....	2	1	....	....	....	1	3	100	76	176
March	1	....	1	....	1	1	2	....	1	....	....	1	....	....	....	....	....	1	100	77	177
April	....	....	....	....	1	1	1	....	....	....	....	....	1	....	....	....	1	1	100	77	177
May	1	2	3	1	2	3	6	....	1	....	....	1	....	2	....	....	2	3	102	78	180
June	1	1	2	1	....	1	3	2	1	....	....	3	....	1	....	....	1	4	101	78	179
July	2	1	3	....	....	....	3	1	....	....	....	1	....	....	....	....	....	1	103	78	181
August	....	1	1	....	....	....	1	....	....	....	....	....	....	1	....	....	1	1	104	77	181
September	....	....	....	....	....	....	....	1	....	....	....	1	....	....	....	....	....	1	103	77	180
October	2	1	3	1	....	1	4	2	....	....	....	2	1	....	....	....	1	3	104	77	180
November	....	....	....	1	2	3	3	1	2	....	....	3	....	1	....	....	1	4	101	79	180
December	1	1	2	....	....	....	2	1	2	....	....	3	....	1	....	....	1	4	100	78	178
Total	8	9	17	4	6	10	27	10	8	....	....	18	3	6	....	....	9	27			

Analysis of Admissions and Discharges During 1966

Inmates as at 31st December, 1965	178
Admissions for period ended 31st December, 1966	27
Discharged for period ended 31st December, 1966	13
Deaths for period ended 31st December, 1966	14
Absconded for period ended 31st December, 1966	....
Total Remaining at Leprosarium, 31st December, 1966	178

Appendix XVIII

Incidence and Mortality of Notifiable Diseases

Diseases Notifiable	1963			1964			1965			1966		
	Cases Re-ported	Amend. Diag-nosis	Deaths	Cases Re-ported	Amend. Diag-nosis	Deaths	Cases Re-ported	Amend. Diag-nosis	Deaths	Cases Re-ported	Amend. Diag-nosis	Deaths
Acute Rheumatism	18	18	....	8	8	....	6	6	1 (A)	....	....	....
Amoebiasis	1	1	....	1	1	....	3	3	1	....	....	....
Ankylostomiasis	....	....	....	37	37	....	2	2	....	....	....	....
Breast Abscess	4	4	....	4	4	....	5	5	....	....	....	....
Brucellosis	7	7	....	4	4	1	3	3	....	3	3	....
Chorea	1	1	....	....	....	....	1	1	....	....	....	....
Dengue Fever	....	....	....	....	....	....	....	....	....	....	....	....
Diphtheria	5	5	....	3	3	....	2	2	....	2	2	....
Dysentery (Amoebic)	2	2	1	2	2	....	....	....	....	....	....	....
Dysentery (Bacillary)	102	102	1	135	135	6	229	229	1	108	108	1
Erythema Nodosum	1	1	....	....	....	....	....	....	....	....	....	....
Hydatid	....	....	....	3	3	1	2	2	....	1	1	1
Infantile Diarrhoea	2	2	20 (B)	44	44	23 (B)	13	13	24 (B)	....	....	23 (B)
Infective Hepatitis	144	144	[illegible]7	100	100	[illegible]3	83	83	3	28	28	3
Lead Poisoning	1	1	....	....	....	....	....	....	....	1	1	....
Leprosy	10	10	....	11	11	....	18	18	....	13	13	1
Leptospirosis	16	16	....	4	4	....	14	14	....	7	7	....
Malaria	31	31	....	5	5	....	2	2	....	3	3	....
Meningococcal Infection	4	4	1	1	1	1	2	2	4	6	6	4
Paratyphoid	3	3	....	....	....	....	3	3	....	1	1	....
Poliomyelitis	5	5	2	....	....	....	....	....	1 (C)	....	....	....
Pleural Effusion	4	2	....	4	1	....	1	1	....	....	....	....
Puerperal Fever	4	4	....	3	3	....	1	1	....	6	6	....
Purulent Opthalmia	36	36	....	14	14	....	1	1	....	....	....	....
Rubella	107	107	....	190	190	....	587	587	....	....	....	....
Salmonella Infection	36	36	1	61	61	1	69	69	....	71	71	....
Scarlet Fever	35	35	....	61	61	....	41	41	....	59	59	....
Tetanus	9	9	2	8	8	5	1	1	1	2	2	....
Trachoma	259	259	....	147	147	....	77	77	....	....	....	....
P.T.B.	252	216	13	225	176	20	188	152	14	154	134	19
Other T.B.	30	28	....	33	31	....	25	25	....	40	40	....
Typhoid Fever	6	6	....	....	....	....	2	2	....	2	2	....
Typhus Fever	2	2	....	....	....	....	....	....	....	....	....	....

Deaths exclude full-blood aborigines

(A) Rheumatic Fever.

(B) Gastro-Enteritis and Colitis (except ulceration) under two years and diarrhoea of the new born.

(C) Late effects of acute poliomyelitis.

Appendix XIX

Vital Statistics for Western Australia

	1964	1965	1966
Mean Population—			
Males	(*a*)	(*a*)	(*a*)
Females	(*a*)	(*a*)	(*a*)
Births—			
Males	8,570	8,280	8,800
Females	8,115	7,906	8,207
Total	16,685	16,186	17,007
Birth rate per 1,000 of Mean Population	20·93	19·85	20·31
Deaths—			
Males	3,738	3,715	3,921
Females	2,691	2,559	2,851
Total	6,429	6,274	6,772
Death rate per 1,000 of Mean Population	8·06	7·70	8·09
Natural increase rate per 1,000 of Mean Population	12·86	12·16	12·22
Infant Mortality per 1,000 Live Births—			
Perth Statistical Division	16·0	17·1	16·3
Rest of State	25·2	29·0	24·1
Whole of State	19·7	21·7	19·3
Still Births—			
Perth Statistical Division	97	110	113
Whole of State	170	181	168
Still Births rate per 1,000 Total Births	10·09	11·06	9·78

(*a*) Not available for publication

Comparison of Infant Mortality and General Death Rate

Place	Infant Mortality Rate			General Death Rate		
	1964	1965	1966	1964	1965	1966
New Zealand (*a*)	19·1	19·5	17·7	8·80	8·68	8·86
Western Australia	19·7	21·7	19·3	8·06	7·70	8·09
New South Wales	20·3	19·1	19·2	9·61	9·33	9·57
Victoria	16·9	17·5	17·4	8·87	8·86	8·90
Queensland	19·2	17·8	17·7	9·07	8·64	8·93
South Australia	19·0	18·4	17·5	8·61	8·26	8·54
Tasmania	20·1	16·6	14·6	8·71	8·27	8·50

(*a*) Includes Maoris

Maternal Mortality Rates per Thousand Live Births

Place	1960	1961	1962	1963	1964	1965	1966
Western Australia	0·47	0·41	0·29	0·23	0·36	0·19	0·41
New Zealand (*a*)	0·34	0·33	0·17	0·37	0·26	0·17	(*b*)
New South Wales	0·68	0·50	0·34	0·32	0·34	0·32	0·28
Victoria	0·25	0·32	0·18	0·21	0·31	0·36	0·25
Queensland	0·68	0·76	0·64	0·25	0·29	0·30	0·40
Tasmania	0·45	0·33	0·33	0·23	0·24	0·40	0·27
South Australia	0·62	0·27	0·61	0·28	0·33	0·34	0·20

(*a*) Non-Maori. (*b*) Not yet available.

Appendix XX

Stillbirth and Infant Mortality Rates W.A.

Year	Total Births including Stillbirths	Stillbirth Rates	Mortality Rates			Total mortality rates under one year	Total mortality rates under one year including Stillbirths
			Under one week	Under one month	Over one month and under one year		
1946	12,398	23·1	17·1	20·6	9·6	30·3	53·4
1947	13,178	23·2	16·9	19·4	1·2	10·2	53·4
1948	13,197	20·5	16·9	18·7	8·4	25·0	45·5
1949	13,779	19·4	16·2	19·0	6·8	25·9	45·3
1950	14,468	16·6	16·2	18·0	8·6	26·7	43·3
1951	15,091	19·7	16·2	19·7	8·5	28·2	47·9
1952	15,697	18·1	15·5	17·7	6·9	24·5	42·6
1953	16,130	16·6	13·4	16·2	7·3	23·4	40·0
1954	16,198	16·7	14·2	15·8	6·4	22·2	38·9
1955	16,862	14·2	13·3	15·8	6·3	22·1	36·3
1956	17,142	13·2	13·0	15·7	6·7	22·4	35·6
1957	17,172	14·4	13·6	14·9	5·9	20·8	35·2
1958	16,956	13·3	12·8	14·2	7·1	21·2	34·5
1959	17,336	13·0	12·3	13·6	6·3	19·9	32·9
1960	17,152	13·2	13·9	15·7	5·7	21·3	34·5
1961	17,318	13·9	10·3	12·6	6·8	19·4	33·3
1962	17,267	11·8	12·6	14·3	7·7	22·0	33·8
1963	17,468	10·2	12·3	14·7	5·5	20·2	30·4
1964	16,855	10·1	11·8	12·9	6·6	19·5	29·5
1965	16,367	11.1	12.8	15.0	6.5	21.4	32.5
1966	17,175	9·8	12·1	14·1	5·0	19·2	28·9

In above table all rates are calculated in deaths per 1,000 of total births, including stillbirths.

INFANT MORTALITY

Year	Births	Infant Mortality per 1,000 Live Births
1946	12,105	36·1
1947	12,874	30·9
1948	12,931	25·6
1949	13,511	26·4
1950	14,228	27·1
1951	14,794	28·7
1952	15,413	24·9
1953	15,862	23·8
1954	15,928	22·5
1955	16,623	22·4
1956	16,916	22·7
1957	16,924	21·1
1958	16,731	21·5
1959	17,111	20·2
1960	16,926	21·6
1961	17,078	19·7
1962	17,064	22·3
1963	17,290	20·4
1964	16,685	19·7
1965	16,186	21.7
1966	17,007	19.3

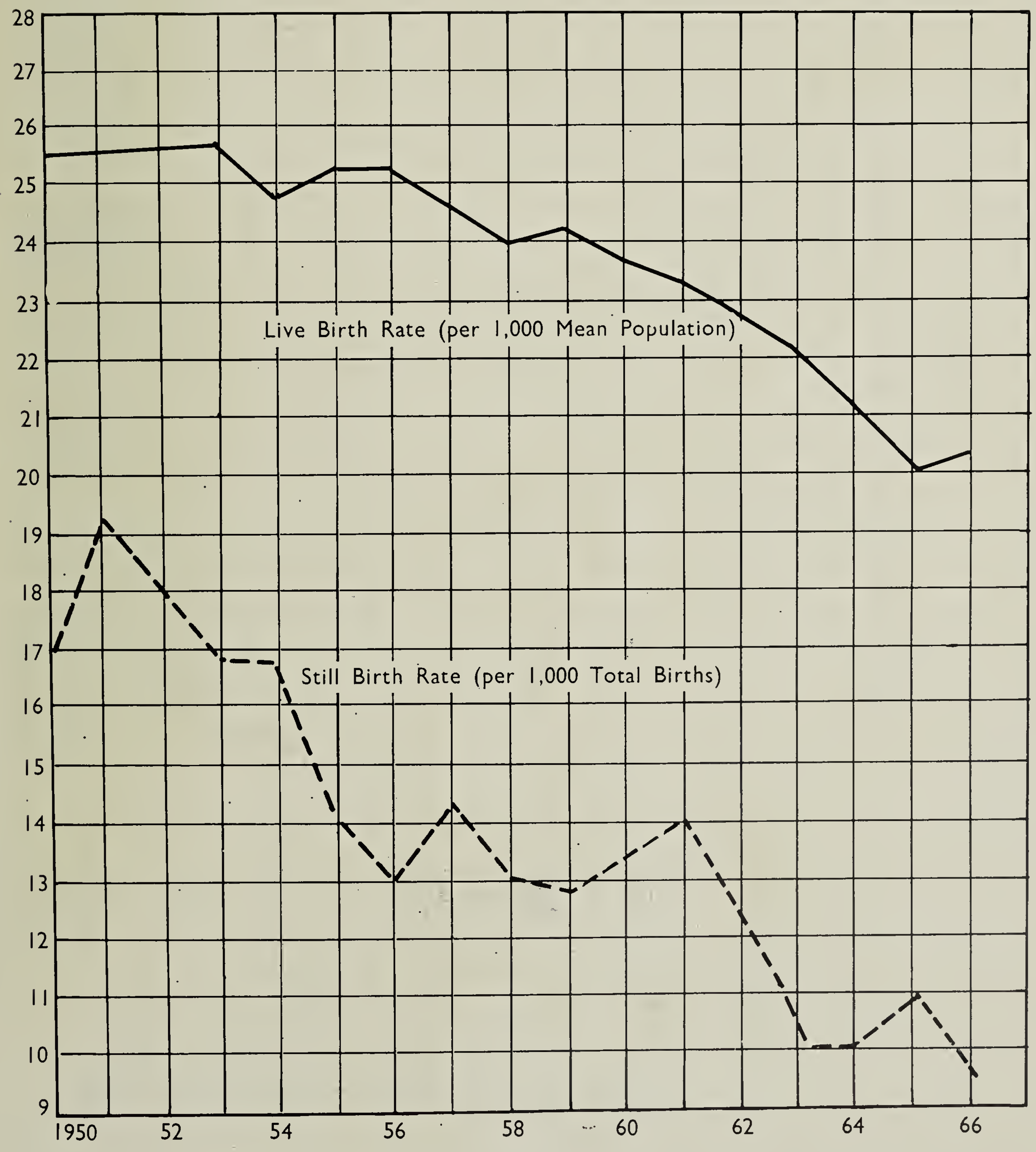
STILLBIRTH AND INFANT MORTALITY RATES

Area of Registration	Total Births Including Stillbirths	Stillbirth Rates	Infant Mortality Rates				Total Mortality Infant Deaths and Stillbirths
			Under one week	Under one month	Over One month and under one year	Total under one year	
1965—							
New Zealand	60,896	11·8	10·5	11·9	7·3	19·3	31·1
1966—							
Western Australia	17,175	9·8	12·1	14·1	5·0	19·2	29·0
New South Wales	78,722	12·2	12·4	13·8	5·1	18·9	31·2
Victoria	64,770	11·8	11·6	13·0	4·2	17·2	29·0
Queensland	33,243	12·2	10·9	12·0	5·5	17·5	29·7
Tasmania	7,512	14·8	9·4	10·0	4·4	14·4	29·2
South Australia	20,556	11·6	9·9	11·4	6·0	17·3	28·9

Appendix XXI

Western Australia – Stillbirth and Birth Rates

Year	Mean Population	Live Births		Stillbirths	
		Number	Rate per 1,000 Mean Population	Number	Rate per 1,000 Total Births
1950	557,878	14,228	25·50	240	16·59
1951	580,317	14,794	25·49	297	19·68
1952	600,615	15,413	25·66	284	18·09
1953	621.034	15,862	25·54	268	16·62
1954	639,963	15,928	24·89	270	16·67
1955	657,323	16,623	25·29	239	14·17
1956	674,459	16,916	25·08	226	13·18
1957	687,448	16,924	24·62	248	14·44
1958	699,915	16,731	23·90	225	13·27
1959	711,737	17,111	24·04	225	12·98
1960	722,900	16,926	23·41	226	13·18
1961	737,386	17,078	23·16	240	13·86
1962	755,259	17,064	22·59	203	11·76
1963	773,235	17.290	22·36	178	10·19
1964	790,224	16.685	21·11	170	10·09
1965	806,189	16,186	20·08	181	11·06
1966	836,345	17,007	20·31	168	9·78



Appendix XXII

Meat Inspection for the Year Ended 31st December, 1966

Type and Number of Animals Slaughtered		Carcases Condemned For—									Part Carcases Condemned For—						Organs Condemned For—					
		Tuberculosis	Actinomycosis	Piroplasmosis	Caseous Lymph Adenitis	Paratyphoid	Traumatic and Septic Conditions	Pleuro-Pneumonia	Other Abnormalities	Tota Carcases Condemned	Actinomycosis	Caseous Lymph Adenitis	Tuberculosis	Arthritis	Other Abnormalities	Total Part Carcases Condemned	Actinomycosis	Echinococcosis Granulosis	Pleuro-Pneumonia	Tuberculosis	Other Abnormalities	Total Organs Condemned
Robbs Jetty (Including Watsons)—																						
Cattle	18,371	19	....	3	....	....	37	1	11	71	866	....	5	25	76	972	163	59	....	3	1,612	1,837
Calves	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Sheep	208,783	....	....	....	52	....	991	....	283	1,326	....	399	....	497	35	931	....	30	....	....	18,845	18,875
Pigs	86,312	32	....	....	....	91	321	....	3	447	....	....	143	966	1,263	2,372	....	....	....	17	120,047	120,064
Midland Junction—																						
Cattle	53,108	14	....	....	....	....	29	....	20	63	723	....	22	6	135	886	34	291	....	20	3,278	3,623
Calves	3,256	....	....	....	....	....	....	....	1	1	1	....	....	....	....	1	....	....	....	....	1	1
Sheep	538,718	....	....	....	16	....	73	....	9,697	9,786	....	135	....	336	21	492	....	....	....	....	101,030	101,030
Pigs	79,945	18	....	....	....	17	36	....	130	201	....	....	129	415	379	923	....	....	....	....	5,995	5,995
Kalgoorlie—																						
Cattle	1,982	1	....	....	....	....	....	....	....	1	23	....	....	....	2	25	1	....	....	1	24	26
Calves	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Sheep	29,696	....	....	....	....	....	1	....	17	18	....	30	....	38	20	88	....	....	....	....	1,164	1,164
Pigs	2,128	....	....	....	....	....	....	....	....	....	....	....	18	....	3	21	....	....	....	2	45	47
Perth Meat Markets—																						
Cattle	1,308	....	....	....	....	....	3	....	40	43	....	....	....	....	....	....	....	....	....	....	34	34
Calves	4,854	....	....	....	....	....	2	....	52	54	....	....	....	....	....	....	....	....	....	....	6	6
Sheep	529	....	....	....	....	....	1	....	12	13	....	....	....	....	....	....	....	....	....	....	68	68
Pigs	375	....	....	....	....	6	....	....	3	9	....	....	....	....	....	....	....	....	....	....	20	20
Fremantle Meat Markets—																						
Cattle	88	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Calves	498	....	....	....	....	....	....	....	1	1	....	....	....	....	4	4	....	....	....	....	....	....
Sheep	536	....	....	....	....	....	....	....	28	28	....	....	....	2	....	2	....	....	....	....	....	....
Pigs	233	....	....	....	....	....	....	....	8	8	....	....	5	....	....	5	....	....	....	....	....	....
* Country Districts—																						
Cattle	41,561	20	....	....	....	....	90	....	51	161	42	....	37	15	131	225	135	201	....	4	830	1,170
Calves	6,269	1	....	....	....	....	10	....	91	102	....	....	....	3	1	4	....	6	....	....	14	20
Sheep	241,373	....	....	....	48	....	211	....	555	814	....	295	....	437	204	936	....	884	....	....	8,600	9,484
Pigs	16,927	3	....	....	....	22	48	....	17	90	....	....	169	38	45	252	41	21	12	31	2,644	2,749
Grand Totals—																						
Cattle	116,418																					
Calves	14,877																					
Sheep	1,019,635																					
Pigs	185,920																					
	1,336,850																					

* Country Districts included—
Busselton, Collie, Capel, Dardanup, Donnybrook, Esperance, Geraldton, Harvey, Katanning, Mandurah, Manjimup, Merredin, Narrogin, Northam, Plantagenet, Upper Blackwood, Wagin, Waroona, York.

Appendix XXIII

Revenue and Expenditure for the Year 1966

Revenue

	$	$
Laboratory Fees		267.437
Branding Fees—		
Fish	3,209	
Meat	40,944	44,153
Septic Tank Fees		37,815
Dental Fees—North-West Clinics		23,388
Child Health Contributions etc.		14,516
Derby Leprosarium—Maintenance Fees, Commonwealth Benefits etc.		86,211
North-West Health Inspector Schemes		3,128
Nurses' Registration Board Examination and Registration Fees		8,351
Public Buildings Inspection Fees		2,375
Private Hospitals' Licences		2,018
Poisons Licences		3,382
Perth Medical Officers' Fees		3,934
Miscellaneous		15,914
Tuberculosis—		
Commonwealth Capital Recoups		2,034
Commonwealth Maintenance Recoups		586,225
Other		23,322
Administration Charges etc.		50.574
		$1,174.777

Expenditure

Salaries and Wages		1,511,002
Laboratory Services		234,569
Child Health Services		320,351
Schools Medical Services		13,489
Schools Dental Services—		
Generally	30,349	
North-West Clinics	19,044	
Subsidy Perth Dental Hospital Mobile Units (including Aero)	29,927	
Bursaries	19,101	98,421
Tuberculosis—		
Miscellaneous	179,955	
Recoup to Sir Charles Gairdner Hospital	426,286	606.241
Leprosy		92,921
Poliomyelitis		47,069
Venereal Diseases		7,981
Ophthalmic Survey		6,765
Medical and Nutritional Survey of Natives		2,004
North-West Health Inspector Schemes		14,475
Nurses' Registration Board		6,412
Physiotherapy and Speech Therapy Bursaries		2.784
Clean Air Act and Poison Committee Fees	624	
Clean Air Act—Equipment	2,406	
Clean Air Act—Incidentals	1,917	4,947
Septic Tank Inspection Fees—Refunds		18,615
Sanitation of Government Buildings		19,870
Printing		10.550
Miscellaneous		67.553
		$3,086,019

Appendix XXIV.

MATERNAL MORTALITY

Period	Average Live Births	Average Maternal Deaths	Average Rate
1901–1905	6,681	28·0	4·19
1906–1910	7,691	43·4	5·64
1911–1915	8,844	39·4	4·46
1916–1920	7,726	41·4	5·36
1921–1925	8,056	34·2	4·25
1926–1930	8,748	46·8	5·35
1931–1935	8,062	35·4	4·39
1936–1940	8,877	32·4	3·65
1941–1945	10,408	24·4	2·34
1946–1950	13,130	21·4	1·63
1951–1955	15,724	13·8	0·88
1956–1960	16,922	8·2	0·48
1961–1965	16,861	5·0	0·30

Year	Live Births	Deaths From									
		Puerperal Septicaemia		Other Puerperal Infection		Abortion		All other Complications of Pregnancy and of the Puerperal State		All Complications of Pregnancy and the Puerperal State	
		No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate
1946	12,105	....	....	3	0·25	5	0·41	18	1·49	26	2·15
1947	12,874	1	0·08	1	0·08	8	0·62	22	1·71	32	2·49
1948	12,981	2	0·15	4	0·31	1	0·08	13	1·00	20	1·55
1949	13,511	....	....	2	0·15	3	0·22	11	0·81	16	1·18
1950	14,228	....	....	2	0·14	1	0·07	10	0·70	13	0·91
1951	14,794	....	....	2	0·14	3	0·02	11	0·74	16	1·08
1952	15,413	....	....	3	0·19	3	0·19	12	0·78	18	1·17
1953	15,862	....	....	....	....	1	0·06	8	0·50	9	1·57
1954	15,928	....	....	....	....	5	0·31	7	0·44	12	0·75
1955	16,623	....	....	....	....	1	0·06	13	0·78	14	0·84
1956	16,916	....	....	....	....	2	0·12	7	0·41	9	0·53
1957	16,924	....	....	....	....	3	0·18	8	0·47	11	0·65
1958	16,731	....	....	....	....	1	0·06	7	0·42	8	0·48
1959	17,111	....	....	....	....	1	0·06	4	0·23	5	0·29
1960	16,926	1	0·06	....	....	3	0·18	4	0·24	8	0·47
1961	17,078	....	....	....	....	2	0·12	5	0·29	7	0·41
1962	17,064	....	....	....	....	1	0·06	4	0·23	5	0·29
1963	17,290	....	....	....	....	1	0·06	3	0·17	4	0·23
1964	16,685	....	....	....	....	3	0·18	3	0·18	6	0·36
1965	16,186	....	....	....	....	1	0.06	2	0.12	3	0.19
1966	17,007	....	....	....	....	1	0·06	6	0·35	7	0·41

(All Rates per thousand live births)

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